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HÆMOCHROMATOSIS.¹

By EUSTACE RUSSELL, M.B., Ch.B. (Edinburgh),
Brisbane.

I HAVE to present to you to-night two patients who are suffering from a comparatively uncommon disease. As there are only one hundred cases in the whole of the medical literature at my disposal, it is extraordinary that I am able to present in one evening two patients with such a rare condition and it is perhaps more extraordinary that one of them has survived the state of coma from which the majority of these patients die and that the survival is attributable to the efficacy of "Insulin." The condition I speak of is known as hæmochromatosis.

The disease is a metabolic condition and is characterized firstly by a deposition of pigments in the tissues, particularly the pigments known as hæmosiderin and hæmofuchsin; secondly by a cirrhosis affecting the liver and pancreas and lastly in the majority of patients by a state of diabetes.

The disease in my two patients is in the pre-diabetic state and the diabetic.

Historical.

There is a considerable historical interest in the disease which was first described by Troisier in

1871 as a bronzed cachexia occurring in diabetes and then by Quincke, who described the iron-containing pigment occurring in a patient with *diabetes mellitus*. In 1886 Hanot and Chauffard called the disease *diabète bronze* and the liver changes *cirrhose pigmentaire diabetique*, thinking that the latter were dependent on the diabetes.

In 1889 von Recklinghausen described the disease by the name by which it is now known, namely hæmochromatosis and showed that the pigmentation of the skin and viscera was due to the deposition of hæmosiderin and hæmofuchsin.

The disease is usually found in men and in those who have passed middle age. One case which is authentic, has been described in a woman, but two cases reported are of doubtful authenticity.

There were only seventy cases reported up to 1923.

Ætiology.

There seems to be no predisposing factor in connexion with the complaint; occupation seems to play no rôle, but alcoholism and gastro-intestinal disturbances are regarded as playing an important part in the causation of the disease. Syphilis has not been noted.

Clinical Manifestations.

Two kinds of cases are recorded, one the less severe form of the disease, consisting mainly of a

¹ Read at a meeting of the Queensland Branch of the British Medical Association on February 5, 1925.

portal cirrhosis and a pigmentation of the skin, as in M., and the other a more severe type in which the bronzed diabetes occurs and in addition to the cirrhosis and the pigmentation there is diabetes. Such a condition occurred in the other patient D.

The onset may be abrupt, but is usually insidious and varies very much in individual patients. In both my patients there were long histories. The pigmentation is generally uniform and varies in intensity from a light shade to a deep earthen colour. In the two patients M. and D. it will be noticed that one is a definite bronze in colour—and he seems to be less bronzed than he was—and the other is a leaden or almost ashen colour, so much so that at first sight I was inclined to regard his condition as argyria.

The mucous membranes are usually free from pigmentation, thus distinguishing it from Addison's disease.

The cirrhosis of the liver is usually demonstrable and the organ can easily be palpated, as in these two patients.

The spleen is enlarged and palpable as a rule, but is not appreciably enlarged in either of my patients.

The blood as a rule reveals no definite alteration. There may be some anæmia, but there is as a rule no alteration in the shape or size or staining qualities of the cells.

The blood sugar in these patients is as one would expect.

The patient in whom the disease has progressed to the diabetic stage, gives a blood sugar reading as expected in a case of true *diabetes mellitus*, namely 0.28%, whereas the other patient who is in the pre-diabetic stage, shows a perfectly normal blood sugar of 0.1%.

The urine of the diabetic, of course, contained sugar and ketone bodies; the other contained nothing of note.

It is as a rule the diabetes which forces the patient to obtain advice and the thirst, polyuria and weakness are the facts in sending the patient to the doctor. Thus it is that glycosuria is present in 80% of the recorded cases.

The pigmentation of the skin in one of these patients is due to hæmosiderin. In the other the nature of the pigment has not been demonstrated.

The spectroscopic examination of the blood did not reveal any abnormality from that of hæmoglobin.

Pathology.

There are four separate and distinct theories as to the causation of the disease. They are: (i.) That the diabetes is primary, (ii.) that the cirrhosis is primary, (iii.) that the symptom complex is a clinical entity and is caused by some toxin responsible for the deposition of the hæmosiderin, (iv.) that there is a primary disturbance of the iron metabolism in the body as a whole.

The *post mortem* findings are characteristic. There is pigmentation of the liver and pancreas and cirrhosis of these organs; in addition, the lymphatic glands draining these organs are pigmented and

cirrhotic. In addition, the thyroid and parathyroid glands and salivary glands are pigmented and the spleen is, as a rule, large and dark in colour. I have already noted that the spleen is not noticeably enlarged in the patients under review.

Microscopically there is found in the affected organs granules of a golden-brown colour, sometimes scattered throughout the cells, sometimes collected in such masses that the nucleus of the cell can hardly be seen and the scars which are made up of fibrous bands, contain large masses of pigment.

The pigment as has been said before, consists of two pigments: Hæmosiderin, an iron-containing pigment and hæmofuchsin, which is iron-free. Large quantities of iron are found in the liver; in one case reported there was estimated thirty-eight grammes.

Diagnosis.

The diagnostic triad consists of the pigmentation of the skin, the hepatic cirrhosis and the glycosuria; these alone suffice to constitute the basis of an absolute clinical diagnosis.

The asthenia, loss of weight and the splenic enlargement are additional factors. The final factor is the finding of hæmosiderin in the tissues.

The differential diagnosis is comparatively easy. The only diseases resembling this condition are Addison's disease and argyria. The former is usually differentiated easily by the absence of the hepatic enlargement and by the presence of a low blood pressure.

The mistake is likely to be made only in the undeveloped stages of the disease and I admit that I thought that the case of M. was one of argyria when I first saw him.

Case Reports.

I would like now to present for your consideration in a little detail the case D., who is of interest because of his disease, further because as you see has made a recovery from what seemed to be a hopeless state of coma supervening upon the list of symptoms already detailed.

The patient was admitted on December 18, 1924, but he had already been under observation in the hospital and under my care the year previous, when the diagnosis of bronzed diabetes was made, but he was not persuaded to remain in hospital and was allowed to go home.

The patient had complained for some time prior to his first visit to hospital of weakness, polyuria, loss of weight and darkening of the skin and during his first stay in hospital the enlargement of the liver and other signs were noticed.

On this last occasion of his admission he complained of frequency and pain on micturition and the loss of weight amounting to nineteen kilograms (three stone). He was noticed on examination to be a thin, wasted man, with a very dark skin, somewhat drowsy and unable to take any active interest in the questions put to him. The heart sounds were clear and some crepitations were noted at the bases of the lungs.

The breath was of the characteristic odour present in these cases of coma; indeed his was the most striking acetone breath I have ever encountered.

The liver was enlarged and its edge extended four finger breadths below the costal margin.

The spleen was not palpable.

The urine contained a large quantity of sugar and ketone bodies. The blood sugar content was 0.28%.

It was obvious that we were dealing with a case of diabetes with very grave coma imminent and that only urgent remedial measures would be of any service to ward off what appeared to be the inevitable end.

I did not think that any measures would be of avail and my experience in these grave cases of coma in the past had not given me much hope for a happy termination even with the aid of "Insulin."

The patient became more and more drowsy and was only aroused with much difficulty. He took no notice when spoken to and would only withdraw the limb on quite painful stimulation.

The treatment adopted was that which is recommended for the treatment of acidosis and coma with "Insulin."

He was given twenty units of "Insulin" every four hours for three doses, with twenty grammes of glucose, that is, two hundred cubic centimetres, of a 10% solution of the glucose in part intravenously, in part subcutaneously and in part intra-muscularly. The reason for the administration other than by the intravenous method was on account of the difficulty of working with the veins.

In spite of this apparently urgent treatment, the patient became rapidly worse, became unconscious and exhibited Cheyne-Stokes phenomenon and the position became really desperate.

The dose of "Insulin" was doubled and with it the glucose, so that the patient was now receiving forty units of "Insulin" and forty grammes of glucose every four hours.

Glucose was also administered *per rectum* and when possible by the mouth, as the administration by the intravenous method presented no little difficulty.

On the fourth day the patient still exhibited Cheyne-Stokes phenomenon. On the fifth day total number of "Insulin" units administered was 425.

During the fourth and fifth days the patient manifested a series of symptoms for which at first it was difficult to account. He became at times restless and noisy, got out of bed and talked at random, complaining that he did not know how or where he was and that he wished to know if his feet were his head or if his head were on the ground or whether he was in bed or out of it.

He shivered and perspired and a rash developed; this was diagnosed as an "enema rash."

It is to be recalled that during this period there was present in the urine a large amount of sugar and ketone bodies and for a time a diagnosis was not made, but careful observation showed that the symptoms were directly due to the intake of "Insulin" and responded to sugar exhibited by the mouth; they were, therefore, due to a sudden lowering of the blood sugar by the doses of "Insulin" given.

Unfortunately there is no record of the blood sugar taken at the time. In addition to the above treatment, morphine was administered as required and pituitrin was also given.

The patient, having got over the severe symptoms of his illness gradually won his way back to health, comparatively speaking, and he is now under treatment as a diabetic according to the scheme we have adopted in this hospital. He is attending the diabetic clinic as an out-patient.

A SURVEY OF INFESTATION WITH ECHINOCOCCUS GRANULOSUS (BATSCH) IN NEW SOUTH WALES.

By IAN CLUNIES ROSS, B.V.Sc.,
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AUSTRALIA has long enjoyed the unenviable reputation of being with Iceland the classical home of echinococcus infestation in man.

In spite of this fact there has been little investigation for the last forty years of the extent of

infestation in man and stock, while even less is recorded of the extent of infestation of dogs with the adult parasite. Davies Thomas⁽¹⁾ ⁽²⁾ in the 'eighties of the last century carried out the last extensive research into the occurrence of echinococcus infestation in Australia as compared with other countries and, while his work was chiefly in regard to the extent of infestation of man, he nevertheless as a result of the examination *post mortem* of a number of dogs, showed how extraordinarily common infestation of stray dogs was at that time. The dogs examined by him were all from either Adelaide or Melbourne. In 1895 Lane Mullins⁽³⁾ published statistics of the deaths from hydatids in New South Wales for the years 1891 to 1893, showing that cases chiefly occurred on the western slopes of the Great Dividing Range. With this exception there appears to have been little information gained as to the relative incidence of echinococcus infestation of man in different parts of the State and none in regard to the infestation of stock. References to the finding of the adult parasite in the dog are apparently very scanty and I know of no reference to its occurrence in New South Wales prior to the commencement of the present investigation. Lendenfeld⁽⁴⁾ reported having found echinococcus in a large percentage of dingoes, but Harvey Johnston⁽⁵⁾ states that since he refers to the finding of specimens twenty millimetres in length, it was obviously a case of mistaken diagnosis. Although I have examined over one hundred dogs at the Veterinary School, University of Sydney, during the past year, I did not meet with any cases of infestation with this parasite.

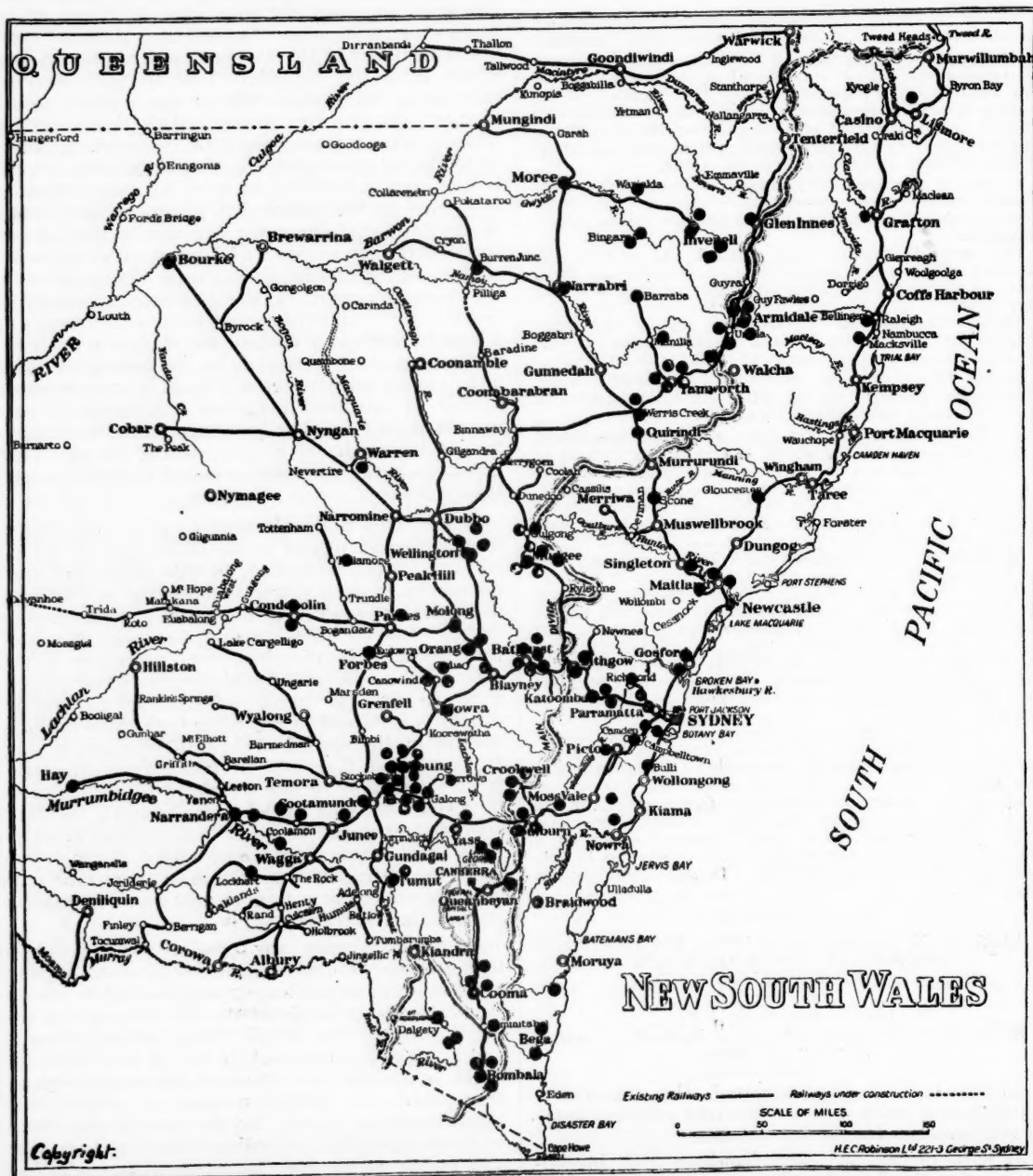
It appeared desirable then to gain more recent information in regard to the occurrence of echinococcus infestation in man in this State and since infestation in man depends indirectly on continued infestation of stock with the larval or hydatid stage and directly on infestation of dogs with the adult tape worm, it is, therefore, very necessary in considering the problem of echinococcus infestation as a whole that as much information as possible should be obtained in regard to both these essential factors in the spread of hydatid disease in man. It was hoped that were it found that infestation of man was more or less restricted to certain areas, if it could be seen on what factors this incidence depended, it might be possible to outline steps for the control of this disease which must at the present time still be regarded as the most important parasitic disease common to both man and domesticated animals in Australia.

In order to gain any possible information as to the most favourable localities in which to commence this investigation, it was decided to consult the statistics available at the two largest city hospitals, namely the Royal Prince Alfred Hospital and the Sydney Hospital, to see if any indication could be derived from them of the country centres from which the greater number of patients with hydatid disease came. In the case of the former hospital statistics extending over fourteen years and in the latter over three years were obtained. Unfortunately only in a minority of cases was the

country address of the patient given and it is not certain that even in the case of those taken that the town or district was the centre at which the patient derived his infestation. On plotting the towns given, however, on a map of the State it will be seen that there is a definite disposition of the cases along the central and southern tablelands and the western slopes and also the New England district in the north and the Monaro in the south. It will be noticed that there is a com-

parative absence of patients from the north and south coast. It is not proposed to consider the factors responsible for this distribution at this stage, it being merely given to explain the centres visited in the course of this investigation.

It was decided to visit centres showing the prevalence of hydatids in man as indicated on this map and in the following report the results of visits to Bathurst, Mudgee, Goulburn, Young, Gundagai and Cootamundra will be considered.



MAP OF NEW SOUTH WALES SHOWING INCIDENCE OF INFESTATION IN MAN IN THE PRESENT INQUIRY.

Plan of Campaign.

Information was sought in regard to the infestation (i.) of the dog with the adult, (ii.) of cattle and sheep with the larval stage or more popularly hydatids and (iii.) of man with the larval stage.

Infestation in Dogs.

The method of obtaining the above information was as follows in regard to infestation of dogs. The *post mortem* examination was carried out of as many dogs as possible and the examination of the intestines for echinococcus and secondly the medicinal treatment of dogs with a reliable and convenient taniacide was adopted to demonstrate echinococcus in the faeces passed. While the first method is, of course, the ideal one, I was unfortunately forced to depend on the second and less reliable method of diagnosis, since great difficulty was experienced in obtaining dogs for *post mortem* examination.

Method of Treatment.

Fortunately the recent discovery of the value of arecoline hydrobromide as a taniafuge enabled the medicinal treatment of dogs to be much more conveniently carried out than otherwise would have been possible and treatment with this drug was used in every case. Dogs were given doses ranging from 0.0075 to 0.03 grammes (one eighth to one half a grain) in 1% aqueous solution as recommended when the writer⁽⁶⁾ was critically testing the value of this drug. The medicament was well tolerated by the dogs and in no cases were any unpleasant after effects noted. Vomition only occurred in two out of fifty dogs so far treated, while in the majority of cases purgation took place in twenty to forty minutes. As far as possible dogs were tied up till purgation occurred and faeces were then immediately examined for echinococcus. It must be admitted that this method of diagnosis was far from perfect, since in the first place the drug, while exhibiting a very high degree of efficacy against other cestodes, had never been tested for echinococcus and in the second the extremely minute size of echinococcus made its demonstration when present in small numbers a matter of some difficulty, even when faeces were collected and subsequently washed and examined carefully. It is quite possible, therefore, that in some cases at least infestations were not diagnosed and this is especially possible in those dogs whose faeces were passed on rough ground, rendering their collection difficult. It may also occur when, observation having to be made of many dogs at one time, some time may have elapsed between the passage of faeces and the examination, rendering the demonstration of such a small and delicate organism as echinococcus even more difficult, owing to the soaking of the fluid part of the faeces into the ground and the drying of the minute echinococcus. In the majority of cases faeces were collected and preserved and subsequently examined by washing and microscopical examination; in all cases the tentative diagnosis of echinococcus infestation was subsequently verified by microscopical examination. It must be remembered that the length of the complete worm is only three to six millimetres.

Infestation of Cattle and Sheep.

In order to estimate the infestation of cattle with the larval or cystic stage, local slaughter houses were visited and the liver and lungs and if possible the other viscera of the cattle and sheep were examined as soon as they were slaughtered. Only those cases in which the lesions were active and contained hydatid fluid or in which their identity could be definitely established, are included in the following data. As far as possible the locality where the sheep were bred was ascertained or the time they had been in the locality before slaughtering, in order to insure that they were representative of the district in question. Only a very limited number of cattle were examined in each locality, as at many small country slaughter houses not more than one or two head of cattle are slaughtered on any one day. The fact that even in cities, such as Bathurst and Goulburn, the slaughtering is not carried out at a single centre, but is scattered among six or more small slaughter houses, necessitated much travelling and expenditure of time to examine even a few head of stock.

Hydatids in Man.

The occurrence of hydatid disease in man was ascertained by examining the local hospital records. By the examination of the daily record for a number of years some idea of the incidence in man could be gained. As far as possible I discussed the various aspects of echinococcus infestation with local medical practitioners and though some of them were totally ignorant of the life cycle of the parasite concerned, other experienced practitioners were able to put forward opinions of great interest as to the local factors concerned in the spread of this disease.

It is proposed in the present contribution to record merely the data gathered as to the incidence of echinococcus infestation in the various centres, while on the completion of this survey it is hoped to deal more fully with the various factors concerned in the spread of this disease, such as the physical characters of the country, local climatic conditions and also the relative importance of different methods of infestation, such as through the drinking water or directly from infested dogs. Suggestions will also then be put forward as to the possible methods of controlling this disease.

Distribution of Echinococcus Infestation.

In the following records echinococcus indicates *Echinococcus granulosus* (Batsch) *Rudolphi*; the specific determinations of the tænia are not necessary for this paper. *Dipylidium* indicates *Dipylidium caninum*.

BATHURST DISTRICT.
Table I.—Animals Infested.

Animal.	Number Examined.	Number Found Infested.	Frequency of Infestation.	Organs with Lesions.
Cattle ...	10	2	20%	Liver: 4 Lungs: 15
Sheep	52	19	36.5%	
Dogs	7	2	29%	

Seven dogs were treated medicinally; of these two were infested with echinococcus, four with *Tænia* and three with *Dipylidium caninum*. All the dogs examined in Bathurst were at the slaughter house.

Table II.—*Echinococcus Infestations in Man.*

Year.	Number of Infestations.	Total Number of Patients.	Ratio of Hydatid Infestations to Total Number.
1911	1	432	1:432
1912	3	422	1:141
1913	4	430	1:107.5
1914	4	394	1:98.5
1915	2	625	1:312
1916	1	665	1:655
1917	3	404	1:134
1918	2	484	1:242
1919	1	549	1:549
1920	1	548	1:548
1921	1	594	1:594
1922	2	540	1:270
1923	0	563	—
1924	0	523	—

The proportion of males to females among twenty-two of these patients was 15:7. These figures are from the records of the Bathurst District Hospital.

It will be seen that from the statistics obtained at the above hospital there appears to have been a distinct falling off in the number of patients treated at the above hospital as shown by the comparison of the following quinquennial periods: 1911-1915, 14; 1916-1920, 8 and for the four years 1921-1924, 3.

MUDGE DISTRICT.

Table III.—*Animals Infested.*

Animal.	Number Examined.	Number Found Infested.	Frequency of Infestation.	Organs with Lesions.
Cattle	1	0	0	—
Sheep	15	4	26.6%	Lungs: 3 Liver: 3
Dogs	10	1	10%	—

Three dogs were examined at the slaughter house; one of them was infested with echinococcus, all three were infested with *Tænia* and two were infested with *Dipylidium*. Six dogs belonging to drovers were examined; four were infested with *Tænia* and two with *Dipylidium*. There were also two other dogs examined, of which one was infested with *Tænia*, while both harboured *Dipylidium*. Of the eleven dogs one must be discarded, since, although ripe segments of *Tænia* were passed, treatment was not effective and the complete strobila was not voided while the dog was under observation. It is possible that echinococci were also present in this dog, but were not passed. Thus for purposes of estimating the percentage of infestation with echinococcus, only ten dogs can be included from the Mudgee district.

The percentage of dogs examined found to be infested with echinococcus was ten.

Table IV.—*Echinococcus Infestation in Man.*

Year.	Number of Infestations.	Total Number of Patients.	Ratio of Hydatid Infestations to Total Number.
1915	0	331	—
1916	2	267	1:133
1917	0	220	—
1918	0	227	—
1919	3	267	1:89
1920-1923	0	930	—
1924	1	72	1:72

During the quinquennial period 1915-1919 five patients were treated and during the period 1920-1924 one patient was treated. There were two males and four females. The figures are from the records of the Mudgee District Hospital.

GOULBURN DISTRICT.

Table V.—*Animals Infested.*

Animal.	Number Examined.	Number Found Infested.	Frequency of Infestation.	Organs with Lesions.
Cattle	2	1	50%	Lungs: 1
Sheep	34	10	29%	Lungs: 9 Liver: 2
Dogs	4	0	—	—

All four dogs were examined at the slaughter yards; of these one was found to be infested with *Tænia* and one with *Dipylidium*.

Table VI.—*Echinococcus Infestation in Man.*

Year.	Number of Infestations.	Total Number of Patients.	Ratio of Hydatid Infestations to Total Number.
1901 (June to December)	3	150	1:50
1902	1	285	1:285
1903	4	251	1:63
1904	0	265	—
1905	2	289	1:144
1906	4	284	1:71
1907	0	297	—
1908	2	353	1:176
1909 (to April) ...	0	128	—
1920	0	478	—
1921	1	638	1:638
1922	0	700	—
1923	2	817	1:408
1924	1	845	1:845

The figures are from the records of the Goulburn District Hospital.

Unfortunately statistics for the years 1910 to 1919 were not obtained.

It is interesting to note that even when hydatid infestations were relatively very numerous, there

was frequently none for a whole year. There were ten affected males and ten affected females.

There appears to have been a decided falling off in the number of patients treated at the Goulburn Hospital during the last five years as compared with the years 1901 to 1905 and this is proportionately much greater when compared with the increase in the total number of patients treated.

YOUNG-HARDEN DISTRICT.
Table VII.—Animals Infested.

Animal.	Number Examined.	Number Found Infested.	Frequency of Infestation.	Organs with Lesions.
Cattle	3	3	100%	Lungs: 3 Liver: 1
Sheep ¹	14	6	42%	Lungs: 5 Liver: 2
Dogs	15	5	33%	—

Of seven dogs examined at the slaughter yards (three at Young and four at Harden), four were found to be infested with echinococcus, four with *Tænia* and one with *Dipylidium*. Of eight drovers' dogs examined, one was infested with echinococcus, six with *Tænia* and three with *Dipylidium*.

In addition to the fourteen sheep shown above which were bred locally, nine other sheep were examined, but since they were bred in Queensland and had only been in this district a short time, they are not included. Of the nine, only one had an infestation with hydatids, cysts being present in both the liver and the lungs.

Table VIII.—Echinococcus Infestation in Man.

Year.	Number of Infestations.	Total Number of Patients.	Ratio of Hydatid Infestations to Total Number.
1911	0	242	—
1912	1	249	1:249
1913	0	271	—
1914	2	316	1:158
1915	1	295	1:295
1916	1	328	1:328
1917	1	319	1:319
1918	1	332	1:332
1919	3	354	1:118
1920	2	—	—
1921 (part)	2	299	1:150
1922	2	456	1:228
1923	4	570	1:142
1924 (to November 31)	0	—	—

It will be seen that there is a definite, if slight, increase in the number of patients being treated at the Young Hospital in the last five years compared with the quinquennial period 1911 to 1915. Four of the patients with hydatids were males and sixteen females.

COOTAMUNDRA DISTRICT.

No cattle or sheep were examined at Cootamundra, nor were any dogs at slaughter houses

¹ Nine sheep from Queensland were examined, but are not included.

examined. A visit was paid to a sheep station and seven dogs were treated. Of these one was infested with echinococcus, four were infested with *Tænia* and two with *Dipylidium*.

Only six of the above dogs can be included in an estimate of the total number of dogs infested with echinococcus, since the faeces passed by one dog were useless for examination for this parasite by the time it was possible to examine them. One dog was infested, which is equivalent to 17%.

Only one patient with hydatids was treated at Cootamundra District Hospital during the seven years, 1918 to 1924 inclusive. There appeared to be little report of hydatid infestations of recent years in this district.

GUNDAGAI DISTRICT.
Table IX.—Animals Infested.

Animal.	Number Examined.	Number Found Infested.	Frequency of Infestation.
Cattle	2	0	—
Sheep	8	2	25%
Dogs	7	0	—

Of two dogs examined at the slaughter yard one was found to be infested with *Tænia*; while of five examined at a farm at Adelong, three were found to be infested with *Tænia* and one with *Dipylidium*.

In addition to the above dogs which received the usual treatment with arecoline hydrobromide, one dog was secured for *post mortem* examination. The intestines were removed and thoroughly washed and examined, but no echinococcus was found. *Dipylidium* was present in large numbers, but no *Tænia* sp.. This dog was found to be infested with hookworms, *Uncinaria criniformis* Railliet.

Altogether eight dogs were examined in the Gundagai district, but none were found infested with echinococcus.

The record of only one patient with hydatid disease in 1921 was found covering nine years from 1916 to 1924 inclusive. Local medical practitioners stated that there had been very few hydatid infestations from the country round Gundagai for a number of years. In fact, one practitioner who had practised there for over thirty years, stated that he had seen very few patients with this disease for the whole of that period. The opinion was held that infestations became more numerous in the neighbourhood of Tumut.

Summary of Present Investigation.

The total number of cattle examined was eighteen. Of these six were infested. This yields a frequency of 33%.

The organs in which cysts were found were the liver twice and the lungs four times.

The total number of sheep examined was one hundred and twenty-three. Of these forty-one were infested. The frequency was, therefore, 33%

The organs in which cysts were found, were the liver twelve times and the lungs thirty-three times.

The total number of dogs treated and examined *post mortem* was fifty. Of these, nine were infested with echinococcus. The frequency was, therefore, 18%.

The number of dogs examined at the slaughter yards was twenty-three. Of these seven were infested with echinococcus or 30%.

Although the investigation of the incidence of echinococcus infestation has not progressed sufficiently to make any definite pronouncement as to the variation in its occurrence in different parts of the State, it nevertheless shows how very prevalent this infestation is in cattle and sheep. The percentage of infestation of dogs must only be regarded as a minimum, since it is obvious that some infestations must be necessarily overlooked when the diagnosis depends solely on the result of medicinal treatment. That 18% of all dogs treated were found to be infested, is sufficiently striking, especially in the light of the fact that Krabbe in 1869 in Iceland found as a result of *post mortem* examination only 28% of dogs infested. One is also struck with the comparison of the lack of infestation in dogs in the city and suburbs of Sydney where, as has already been mentioned, no infestations were detected among over one hundred dogs examined.

It is not proposed at this stage to consider whether there appears to be a decrease in the number of hydatid infestations in man in the light of the data so far obtained, but merely to point out that even were this the case, given a high percentage of infestation in cattle and sheep with the larval stage and of dogs with the adult stage, there will always exist a potential source of infestation and danger to man.

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HYDATID DISEASE OF THE LIVER.

By FRED. D. BIRD, C.B., M.B., M.S. (Melbourne),
Honorary F.R.C.S. (England).

DR. FAIRLEY's most interesting paper recently published on hydatid disease of the liver has induced me to leave the cool shade of retirement. Unfortunately, I cannot give the wealth of statistics that Dr. Fairley has at his command, but, having

had a large experience of hydatid disease, I thought a few remarks might not be unacceptable to some of the readers of the journal. There can be no doubt that the liver is the organ most commonly occupied by the unbidden guest, again infection of other organs in the same patient is not uncommon.

The presence of a hydatid in a patient or the history of hydatid should always be looked upon as of the highest importance in diagnosis. A person who has had hydatid disease, is much more likely to have further hydatid manifestations than a person who has not had it, is to start the experience. Syphilis and hydatid disease should always be thought of in any obscure conditions. Syphilis may produce in the abdomen signs that are indistinguishable from hydatid before operation. In one operation on a globular hepatic enlargement of considerable size, of whose echinococcal nature I had no doubt, I found on incision a tissue with the exact similitude of a thick adventitia. Into this I introduced a trocar, prior to opening. No fluid followed and I sagely remarked that the cyst was tightly packed with daughter cysts, but the knife cut into no cyst, only into a fleshy heterogeneous mass which suddenly awakened in my mind ideas of gumma. The microscope proved the correctness of the tardy diagnosis and the patient got quite well with proper treatment.

Years ago I proved to my own satisfaction at all events that many of the tumours of the abdominal wall named dermoid were really syphilomas in varying degrees of fibrosis. Once I essayed to open a tumour of the abdominal parietes, dilating at the same time upon the importance of remembering its possibly specific origin. The knife entered a hydatid adventitia containing many cysts and the finger went further through the abdominal wall by way of a small tunnel into an abdominal adventitia, proving the presence of a dumb-bell hydatid. These I believe may be of subserous or of abdominal origin, generally the latter.

My lectures on hepatic hydatid disease were pre-faced by the remark that the popular idea of liver hydatid was that of a globular, painless, slowly-growing, more or less innocent enlargement of the liver. I then commented upon exceptions to this. Thus it was admitted that the enlargement was generally globular as opposed to being discoid, but sometimes along the liver margin small cysts would arrange themselves in such a manner as to suggest carcinoma or the lumpiness of syphilitic hepatic disease. This, I believe, obtains only along the anterior edge. It is uncommon, but very deceptive. Then there is the question, which is liver and which is hydatid? Is the liver sitting on the hydatid and forcing it down or is the hydatid sitting on the liver and pushing it further into the celom? All of which seems simple of solution on paper, but may be hard in practice. Here the fluorescent screen may help much. It must be remembered that in the nature of things, the hydatid cyst develops towards the periphery of the organ. It is quite the exception for a cyst to have liver tissue all round it. I have, however, met such in operations and found them associated with much pain (why I do not know) and difficulty of diagnosis. Fortunately most cysts occur on the surface and avoid

the blunt posterior edge of the liver, a very dangerous place, as here the cyst has temptation to open into the *vena cava*, causing sudden death from hydatid embolism. A hydatid cyst on the anterior surface of the liver exerts inhibitory pressure on a smaller one behind. This seems to me the probable explanation of those disappointing cases I have met, in which after successful treatment of one cyst a second enlargement some months afterwards occurred at the site of the first, to be followed in several instances by a third. In my experience, while cysts of the anterior surface and margin should be successfully treated, cysts in the portal fissure were deadly and difficult of diagnosis. In this situation pain is a prominent symptom and so is grave jaundice. Exploratory operation lands the surgeon in great technical difficulty. This is fortunately the most uncommon form of jaundice in relation with echinococcal disease and is due to the pressure of a hard adventitia on the common bile duct. Another form is due to the passage of small cysts down the bile duct after the bursting of a cyst into a duct. This, of course, gives rise to pain of an intermittent character. The third form of jaundice of echinococcal origin is found when a suppurating cyst has caused cholangitis and it is indefinite in duration.

The relation of the adventitia to neighbouring organs may be important. Its growing capacity while obliterating blood vessels (except the *vena cava*) opens into the more fibrous bile ducts. Rupture into the gall bladder is, I think, very rare, as also is the production of cysts in the gall bladder. In old days bursting of the adventitia into the colon was so common that French observers looked upon it as the natural evolution of the disease, which very generally resulted in a cure. Rupture into the stomach is known, but there is probably a gastric pathological basis for it, as in the case of a lady who had a long history of gastric ulcer. I opened a large hydatid cyst of her liver and marsupialized it. She progressed very well for a week, when on taking some milk she had a sudden collapse and died. The *post mortem* examination revealed milk in the adventitia and dressings and death was apparently due to shock. Happily so large a rupture hardly ever occurs through the diaphragm into the pleura. Perforation through the diaphragm is subsequent to the fusing of double layers of peritoneum and pleura, Nature accomplishing a small opening into a bronchus without immediate risk. Thus expectoration of hydatid elements may have an hepatic origin and bile will find the same route. In the Melbourne Museum is to be found a specimen showing a hydatid cyst in the substance of the diaphragm itself.

The presence or absence of enlargement of the superficial veins is a question that needs further elucidation. I have never been able to discover the factor which I could definitely associate with the presence of dilated veins, but I have reason to believe that some cysts will produce enlargement of the veins on the under surface of the diaphragm. The only hæmorrhage connected with hydatid disease that I have encountered in a considerable

operative experience, was in a transpleural attack on a large cyst on the upper surface of the liver. Horrible hæmorrhage occurred on incision through the structures into the cyst. Dr. Maudsley and myself believed the blood to come from a partially divided, greatly dilated vein just beside the fusion of adventitia and diaphragmatic peritoneum. Much trouble was experienced in conducting the case to a favourable ending.

Hæmorrhage in operations on liver hydatid should be remarkable by its absence if you do not incise the hepatic tissue which is seldom wanted, or you are not operating on a cyst in the vicinity of the *vena cava* which is very unlikely, or you do not meet with a cavernous vein on the diaphragm as in the case just related. The intercostal spaces are often widened in liver hydatid cysts, especially when the upper surface is the seat of the cyst and pressure must be exerted in various directions, but I have never had trouble with intercostal bleeding. I have never seen hæmorrhage from the inner aspect of the adventitia, forming a contrast with what may obtain in lung hydatid cysts.

Though adventitious, the adventitia is part of ourselves and partakes of our human weaknesses; thus it may become inflamed or be the site of carcinomatous or amyloid degeneration. Of syphilis in the adventitia I know nothing. Of the ultimate removal by Nature of the adventitia after marsupialization I have no doubt. In several instances I have had occasion to operate in an area where I had previously marsupialized a cyst and found no evidence or the very slightest evidence of what had been a large or very large adventitial sac.

It is possible that the large percentage of cases of hydatid of the liver in Dr. Fairley's paper in which pain was the first or an early symptom, may be accounted for by the fact that all the patients were in a public hospital. Private patients seek advice, as a rule, earlier. While admitting that pain is often experienced, my belief is that it has not the salience that Dr. Fairley's figures suggest.

Not seldom have I been surprised to find in patients with cysts on the upper surface of the liver breathlessness without pain as the symptom for which advice was desired. Dyspnoea may be caused by the mere size of the cyst or by a passive accumulation of fluid in the pleura due to interference with the lymphatic currents or due to a pleurisy with effusion. If a hydatid causes breathlessness, it is more likely to be an hepatic than a pulmonary cyst. If a patient spits up cysts the chances are, I believe, about level as to its origin being in the liver or lung. Pressure of hepatic cysts may cause absorption of portions of ribs, but whether this induces pain I cannot say. Pain, of course, will be present if daughter cysts pass down the bile ducts. Pain as a result of suppurating of the adventitia is very variable. It occurs when the inflammatory process reaches the parietal peritoneum, but such invasion does not necessarily occur. Some displacement of the heart may undoubtedly be a result of the presence of a large sub-diaphragmatic cyst, quite apart from pleural effusion.

The rate of growth of hydatid cysts is another instance of the extreme variability of their symptoms. As a rule a cyst grows slowly, sometimes it grows exceedingly fast; such are generally daughterless cysts. Sometimes they change their rate of growth from very slow to very fast and this apart from rupture of the adventitia.

As a rule they grow in the direction of least resistance; in a few cases they will go straight ahead through any tissues in their way. They generally simulate innocent tumours, occasionally they behave as malignant ones. How long may a hydatid cyst live? I do not know, but I have had acquaintance with individuals over twenty-six, over twenty-two and other eighteen years of age. In some cases they seem just to maintain life and no more. As the adventitia, so the hydatid and in pulmonary cases so the treatment. In one instance I had recourse to a saw before I could open an adventitia so gypsophilous was it; a year elapsed before the last remnant of lime was removed in this case. The deposition of lime is very variable. Occasionally the whole adventitia becomes mineralized; sometimes large areas and in other cases small plaques are found at odd intervals. It is probably the sign of age in a cyst, but the causes of the deposition of lime are unknown. Convalescence is naturally longer with its presence.

Of abdominal symptoms indigestion is the commonest, but it cannot be called a very prominent symptom in uncomplicated cases. Ascites is very uncommon. I once tapped what I thought was an ascitic abdomen and it proved to be a vast hydatid, the biggest I have ever seen. If a suppurating cyst bursts into the colon, diarrhoea and enteric symptoms will intervene.

Symptoms due to sepsis are very variable. It is astonishing how a grossly suppurating adventitia may be present with but slight symptom of sepsis. The acme of sepsis is seen in those fortunately rare cases in which a suppurating cyst has burst into the pleural cavity, a *dénouement* which is very usually fatal in spite of free opening of the pleural cavity and lavage with oxygen. It is generally very hard to say whether a particular cyst has suppurated or not. Rise of temperature is not a certain criterion of it, as this may exist without suppuration in quickly growing hydatids. I used to think that occasionally a sense of sponginess over the tumour was afforded to palpation when suppuration had occurred. Altogether its presence is difficult of establishment before operation. Of the route by which inflammatory elements gain access to the adventitia I am not prepared to speak, but I do believe that injury is to be found in causal relationship. The inflammatory process is not general all over the interior of the adventitia at first. Pus may be present in blobs in the general fluid of the cyst and while the inflammatory process with the production of pus is sooner or later fatal to the mother cyst, daughters are not killed by it for a long time. Like other organized beings, hydatid cysts have a limit of life and at times the surgeon will seek for the mother cyst to extract it; but his search is rewarded only by the finding

in small amount of aseptic gelatinous remains on the floor of the adventitial cavity. It is possible that certain so-called simple cysts of the liver may have had a previous echinococcal origin. Bile seems to be inimical to the mother cyst, but not to her daughters.

That the expanding cyst can cause disappearance of liver tissue there is no doubt and cases are seen in which the liver is so caverned and spread out over a very large cyst, that wonder is excited as to how the liver functions are carried on with so little liver tissue; but, as a rule, the cyst grows into the potential cavity of the *cælom* and interferes but little with the mass of the liver. Compensatory enlargement of the left hepatic lobe is often seen. I never could see that cysts, except those on the upper surface enlarging between the ever-moving diaphragm and the mass of the liver, could produce hepatoptosis to such a degree as to cause pain. The presence of a large cyst increases the abdominal pressure considerably and liver *cum* cyst mass is therefore well supported from below and the liver is not dislocated. A small incision will find the surface of the large cyst presenting firmly in the wound not because of adhesions which are unusual, but because of the increased abdominal pressure.

Asymmetry of the abdomen and costal margins is a common sign of hydatid cyst which has attained a large growth, but it must be remembered that many hydatids pass an unnoticed existence in the human liver. The great tension of the cyst is a noteworthy characteristic giving a feeling of solidity to palpation and making the tumour easily examinable. The tension of hydatids serves to distinguish them from simple cysts of the liver and omentum. It prohibits the elicitation of fluctuation except where the cyst is very large or has been tapped. The tension of a hydatid is greater than that of a hydronephrosis and I believe that low tension and therefore fluctuation in a tumour denies its echinococcal nature. The tension, great as it is, increases when suppuration occurs, but not to the surgeon's examining hand, as some sogginess from advent of fluid round the inflaming adventitia occurs and obliterates to some extent the marked definition of any palpable portion of the circumference of the cyst.

Of the conditions leading to the production of adhesions it is difficult to speak. Inflammation of the adventitia, of course, tends to their presence, but many suppurating cysts are not accompanied by adhesions. Adhesions are the exception with cysts on the anterior and lower surfaces of the liver and on its anterior edge. They are more common on the upper surface and in the portal fissure. They are often absent in cases of hepatic cyst, where the surgeon most expects them. Omental hydatids *per contra* revel in adhesions.

Rupture of the cyst must be differentiated from rupture of the adventitious covering. In the course of Nature the mother cyst may die and no one may be the wiser, but two accidents are the cause of rupture of the cyst, trauma and access of inflammation.

Whether bile can gain access to the cavity of the adventitia without one of these conditions I do not know. The echinococcal living cyst wall is so exquisitely applied to the humanly living adventitial wall that it seems very doubtful if bile with its low tension could force the high tension cyst away from the surface of the adventitia without the aid of sepsis or injury. Sooner or later every lung hydatid ruptures, not so every hepatic cyst; trauma which need not be severe, is, I believe, the commonest cause of the death of the mother cyst with the access of bile to the cavity of the adventitia. A slight jarring of the liver may be sufficient to allow a momentary effusion of a small amount of bile between the cyst wall and the adventitia. Tapping with a trocar may allow fluid to run all round the exterior of the cyst, divorcing it from its nourishing adventitia.

Strange cysts are found in the liver sometimes; they are called simple cysts and their mode of origin is obscure. I cannot help thinking that some of these are of echinococcal origin, having been anencephalous cysts which have died by effluxion of time or excessive fibrosis of the adventitia and all traces of their membrane has disappeared.

When the adventitial sac is ruptured (a well-recognized accident) some of the echinococcal contents are evacuated as a rule into the general cavity of the *cœlom*, but it may be into the colon or stomach or very rarely into the gall bladder. On three occasions I have operated on patients in whom an accident a few hours before might reasonably have been expected to rupture an adventitia and have found daughter cysts and fluid in various parts of the abdominal cavity. Also in patients whose history of years before has suggested the rupture of an adventitia, I have found the peritoneal cavity the seat of growth of several cysts. As a rule such cysts have another origin, but that it happens in this way sometimes I have no doubt. The symptoms of the rupture of an hepatic cyst of echinococcal birth vary from slight discomfort to fatal toxæmia. All sorts of poisoning symptoms have occurred immediately on tapping, on accidental rupture and even at open operation. Why some cysts contain poisonous fluid and some do not is unknown. It is hardly likely that the fluid is absorbed in some cases and not in others. The variation must be in the fluid itself and years ago I came to the conclusion that what evidence I could collect, pointed in some degree to the daughterless cysts as being most likely to possess the toxic principles.

Operative Treatment.

As regards operative measures my practice crystallized itself in this way. Most hepatic hydatids present themselves in positions readily accessible to the surgeon. A considerable portion of their globularity may be embayed in liver tissue, but they will afford a considerable free surface for surgical technique. The most prominent part of the tumour should be selected for the site of the incision. It must be inadvisable to have hydatid fluid free in the peritoneal cavity, whether it be

toxic or not and still more is there objection to the straying of daughter cysts. To prevent these untoward happenings I resorted to these safeguards, as I think them: Firstly, the anaesthesia was not allowed to become deep. Secondly, the incision was small, five to seven and a half centimetres (two to three inches). Thirdly, the adventitia was opened boldly, the left forefinger following into the adventitial cavity at once dragging the cut in the adventitial sac into the parietal incision. In this way the surgeon is in complete control of the surgical position. Four or more stitches are put in by him and tied by his assistant. They include in addition to the adventitia all the structures of the abdominal wall except skin and muscle. As the adventitia is being incised the assistant presses his hand firmly on the abdomen below the tumour. All this can be done in a very few minutes. The mother cyst can now be extracted and as many of the daughters, if they are present, as can be easily and quickly accounted for. No lavage and no long-continued attempts to clean the adventitia are admissible. A tube is inserted reaching almost to the innermost part of the sac. With a large experience behind me I believe this is the best procedure in easy cases which include much the largest number of hepatic hydatids. The closing of the sac without drainage leaves an element of uncertainty obnoxious to the surgical mind. One does not know how much fluid our cleansing methods have called forth, one does not know when bile enters the sac or how much and the future of the adventitia is wrapped in humanity and obscurity, both unsurgical proceedings. Sometimes, however, in badly placed cysts we have no other method than to leave the sac undrained by a tube and then some surgeons close it and others leave it to adapt itself as best it may. I prefer the latter. When a tube is inserted it is left to drain for two, three or four weeks, occasionally in very large cysts longer. The former large adventitia disappears almost if not quite entirely. When the sac is suppurating, my treatment is the same and no extra risk due to the purulent nature of the contents of the sac is apparent. One manœuvre must be attended with care and judgement and that is the shortening of the tube in suppurating cases. The inflamed adventitia, whose sides fall in after incision and evacuation, may coalesce if the tube is shortened too soon and produce a bag of pus deep in from the external incision and this may be very difficult to open with safety. This accident may occur easily and most unostentatiously. It is most likely to occur in cases of large suppurating cysts. The resulting abscess may give no or little sign for a long time and is altogether a condition the production of which should be carefully avoided.

In all cases it is inadvisable to cut hepatic tissue with knife or needle, even when it exists in a very thin, innocent-looking layer. No reference has been made to packing with gauze. It is unnecessary and harmful in the easy cases where a tumour is readily palpable. The treatment of multiple cysts in liver and abdomen is trying both to patient and surgeon. My motto was "*point de zèle*." A time limit should be observed and many opera-

tions be performed rather than one too long. Small cysts in the portal fissure cannot be marsupialized. They must be emptied and left, but I used a tube with some gauze round it in such cases. While I have the highest opinion of the surgical acumen of my friend Mr. Kilvington, I should not use chemicalized solutions in any case and with the diffidence of age I also suggest that another of my best students, Dr. Fairley, is a little too courageous in advising that in certain cases the liver should be "thoroughly explored."

For cysts on the upper surface of the liver the transpleural route is to be chosen and the point I wish to labour is that the incision should be made as far forward as is compatible with exposing the cyst. When I opened the pleural cavity for general empyema I chose the mid-axillary line, but when I wanted to go beyond, I selected a point as far forward as possible. Technical danger and difficulty are less the further forward the incision is and the fluorescent screen greatly helps in showing the position of the cyst. A portion of rib is removed, a small trocar is inserted through four layers of serous membrane to give assurance of the presence of the cyst beneath and then immediately a knife is plunged through the four layers of serous membrane and the adventitia into the cyst *digito juvante*. The adventitia is pulled up into the wound and the surgeon is in full command. In some cases the adventitia is so full of daughter cysts that free fluid is absent and the tapping is dry unless a daughter cyst is perforated. The physical signs and the evidence of the screen are so strongly diagnostic of the cyst being present, that this negative tapping should not prevent our gaining access to the interior of the adventitia. In such cases I am sure it is wrong to spend a long time in trying to remove daughter cysts and the use of lotion is to my mind inadmissible. The possibility of bile complicating the operative field is ever present. It is ever ready to flow into the adventitial sac whether we close it or not. Uncertainty thy name is Bile. It may appear during the operation or just as it is finished or the next morning or several days after or not at all. When it does appear it may be sterile or it may carry bacteria. It may be in small quantity or flow in such an amount as to produce eventually dangerous dehydration.

Looking back upon my results I am lucky enough to be able to be unashamed, but I remember gratefully how much the Adelaide school of surgeons taught us in this regard.

Reports of Cases.

AN INTERESTING CASE OF LARYNGEAL DIPHTHERIA.

By F. W. R. LUKIN, M.B., Ch.M. (Sydney),
Resident Medical Officer, Children's Hospital, Brisbane.

L.S., male, aged one year and seven months, was admitted to the Children's Hospital, Brisbane, on November 1, 1924. The history was that the child had had difficulty with breathing which was gradually getting worse. The

difficulty was first noticed thirty-six hours before admission and since then had become progressively worse. At no time had the symptoms shown signs of abating. The child had spent a very bad night, was extremely restless and perspired freely. During the twelve hours previous to admission the child had not taken any nourishment.

On examination it was found that the temperature was normal. The child was well nourished and was in very evident respiratory distress. Inspiratory stridor could be plainly heard in the adjacent room and was of that harsh, non-musical type so suggestive of laryngeal diphtheria. There was considerable sternal retraction. The child was evidently frightened and inclined to be restless, but his condition was not so bad as to call for immediate intubation. The pulse was rapid, but of moderate tension and quite regular. No signs of faucial diphtheria could be detected.

The child was admitted immediately, placed in a steam tent and given hypodermically morphine 0.0015 gramme (one fortieth of a grain) and atropine 0.0003 gramme (one two hundredth of a grain).

He was also given 40,000 units of diphtheria antitoxin by intra-muscular injection. Five hours after admission the child's condition became worse. He was cyanosed, restless and sweating and intubation was accordingly performed with a number 1 tube. No difficulty was experienced in the insertion. Immediate relief was obtained and food was taken. This was followed by sleep.

The following day the tube was coughed up, together with a quantity of small pieces of membrane and of pus and the child was able to breathe with moderate comfort. Three hours afterwards, however, the child became again cyanosed and re-intubation was performed. A swabbing of the throat was found to contain diphtheria bacilli that day. From November 2, 1924, the child was intubated every day until November 12, 1924, and on several days more than once and as often as four times. In the meanwhile a slight but persistent cough was noted and the tube was often immediately rejected and had to be reintroduced. On one day the tube was introduced no less than thirteen times. At no time during the whole period was the tube in the larynx for more than twenty-four hours continuously, as it was removed after that time if not coughed out.

On the fourth day another 40,000 units of antitoxin were administered.

During the period from November 2, 1924, until November 12, 1924, the child was unable to do without the tube for longer than an hour and often only for five minutes. The child was nervous and would cry as soon as the tube was removed or coughed up and could only be pacified by nursing. Crying very soon induced respiratory difficulty, necessitating re-intubation.

The advisability of performing tracheotomy was seriously considered, but Dr. Scholes's information that in his experience the majority of retained tracheotomy tubes have followed retained intubation tubes, was sufficient deterrent.

On the twelfth day the child coughed the tube up and seemed greatly relieved and progressed satisfactorily for five days, but on the seventeenth day he became worse and re-intubation had to be performed.

From then on the tube was allowed to remain in for forty-eight hours continuously. It was removed on the nineteenth day and an autogenous vaccine made, which consisted mainly of *Staphylococcus albus* with some few short bacilli. The tube was replaced within half an hour of removal and left *in situ* for forty-eight hours, when it was removed. A dose of 200,000,000 organisms in the autogenous vaccine was then given and repeated every second day. The tube was then replaced after being out six hours and left in for forty-eight hours, when it was finally removed on the twenty-fourth day. From then on the child had slight respiratory stridor, but not sufficient to prevent sleep. The stridor gradually got less and less and finally disappeared altogether. The child immediately began to put on weight and to take food exceedingly well and to play with his toys and take an interest in his surroundings. He was discharged cured on December 13, 1924.

During this period of three weeks, the patient exhibited no signs of cardiac involvement from the diphtheria

toxin. During attacks of cyanosis from laryngeal obstruction, his pulse became weak and irregular, but improved immediately on intubation. The temperature rose in response to both injections of serum, but apart from that was normal. At no time did he exhibit any signs of broncho-pneumonia.

Sedatives including morphine 0.0015 to 0.002 gramme (one fortieth to one thirtieth of a grain) and potassium bromide 0.18 gramme (three grains) with chloral 0.09 gramme (one and a half grain) were used three times a day without any success in warding off the attacks. Hot fomentations to the neck were equally ineffectual and steam was also of no use.

Comment.

The most obvious comment on this case is the length of time during which intubation was used. Fortunately patience was rewarded by the desired result and the risk of a retained tracheotomy tube was obviated. A retained tracheotomy tube in one so young would have been nothing less than a disaster.

What caused the symptoms of laryngeal obstruction to persist? I am inclined to believe that it was a condition quite apart from the diphtheritic invasion. An ulcer of the cord or cords, possibly traumatic, appears the most logical conclusion. In the absence of the tube with the crying of the child and the consequent congestion of the head including the larynx, the oedema thus brought about was sufficient to occlude the airway.

There is a question which naturally arises. Did the change from having the tube in continually for twenty-four hours to forty-eight hours have any influence towards recovery? One is tempted to think certainly that the longer period gave the ulcer longer time to progress in the stages of healing, whereas the shorter period did not give it sufficient time to progress beyond the stage of surrounding inflammation and introduced the element of further trauma which set up further congestion of the part. Unfortunately, the child's condition was never such as to warrant examination by direct laryngoscopy.

Then as regards the vaccine. Did it have any influence? It was cultured direct from the larynx from specks of pus on the back of the withdrawn tube. This is a question which cannot be answered with any assurance, but it certainly indicates that in similar circumstances vaccine therapy is well worth a trial.

Acknowledgement.

I am indebted to Dr. Gavin Cameron for permission to publish details of this case.

Reviews.

A HAND-BOOK ON TUBERCULOSIS.

IN "Modern Methods in the Diagnosis and Treatment of Pulmonary Tuberculosis," Dr. R. C. Wingfield provides the general practitioner with a useful, readable book.¹ While no new matter is introduced the different aspects of the disease are dealt with briefly yet clearly and his arguments are easily grasped and understood.

After first touching on the incidence of the disease he passes on to the importance of early diagnosis and definite advice is given as to how such diagnosis can be correctly made. For this purpose he even draws up a definite scheme for the guidance of students.

The classification of the different stages of the disease are explained and methods by which the activity of the disease can be estimated, are considered. As one would expect treatment is primarily that as accepted in the sanatorium whether carried out in a sanatorium or in the home. All treatment must be varied so as to suit the individual patient and his special circumstances and certain warnings are given to prevent disappointments.

¹ "Modern Methods in the Diagnosis and Treatment of Pulmonary Tuberculosis," by R. C. Wingfield, M.B., M.R.C.P.; Modern Medical Monographs, Edited by Hugh Maclean, M.D., D.Sc.; 1924. London: Constable and Company, Limited; Sydney: Angus and Robertson, Limited. Demy 8vo., pp. 134, with illustrations.

Considerable space is taken up with special methods of treatment especially artificial pneumo-thorax and thoroplasty. Tuberculin are also admitted to be useful in certain cases and Dreyer's treatment is mentioned though most authorities now consider it of little use.

The chapters on the treatment of special symptoms and the care of tuberculous children are disappointing, but his advice as regards the after care of recovered patients is sound and good. While in no way solving the difficult problem of after care and treatment, he lays down rules that are workable and can be carried out by all who wish to do so.

While this book is in no respects a text-book on tuberculosis, it is written so simply and clearly that it should be very useful to all medical practitioners who have not time to study larger works.

EMERGENCY SURGERY.

"EMERGENCY OPERATIONS FOR GENERAL PRACTITIONERS ON LAND AND SEA," by Mr. H. C. Orrin, is a small hand-book¹ extending only to one hundred and thirty-five pages, written primarily as the author states in his preface, to "help and guide the general practitioner, the recent graduate, the medical man at home and abroad in isolated parts of the country, the ship's doctor or the naval surgeon, any of whom may have to perform emergency operations at any time, often under the most primitive conditions."

The book contains, in addition to the usual chapters on emergency operations on the abdomen, on the appendix, for hernia, on the head, a very practical introductory chapter on the use of local anaesthesia, including spinal, intradermal, infiltration and regional anaesthesia. There is also a very practical chapter on the preparation of an emergency theatre and the many necessary preparations for an operation in unusual surroundings.

The author has not much space to devote to each operation and pre-supposes a fair working knowledge on the part of the reader, purposely avoiding all reference to diagnosis and confining his matter to the anatomical and surgical essentials. The range of subjects covered is very wide; many surgical emergencies receive attention and even though the reference be necessarily short, the information conveyed is essentially sound and clearly put, so as to convey to the reader in the smallest possible space the information he requires in his emergency.

The illustrations are plentiful and form a feature of the work, being very well executed and instructive; many of them are reproductions of actual photographs. The chapter on appendectomy is profusely illustrated. Use is made especially in the chapter on amputations of a plate containing three illustrations of the limb, the first showing the incision and the surface anatomy of the limb; the second a skiagram of the same part, showing the relation of the incision to the bony parts; the third a skiagram of the limb with the vessels injected with opaque material, which shows up very clearly the relationships of the vessels that the operator is likely to meet in the course of the amputation. The skiagrams of injected specimens are found throughout the book; even in the chapter on the head and neck, they are very instructive and well executed. On the whole, this small hand-book is one that we can recommend to those for whom it was written, practitioners faced with a sudden surgical emergency with which they are unfamiliar. They will find in it accurate information, practical in its details, concisely written, profusely and clearly illustrated.

EPIDEMIC ENCEPHALITIS.

EPIDEMIC encephalitis is now a disease of almost world-wide incidence and so many cases have occurred in Australia that the majority of practitioners in this country have been enabled to observe at any rate some of its extra-

¹ "Emergency Operations for General Practitioners on Land and Sea," by H. C. Orrin, O.B.E., F.R.C.S. (Edin.); 1923. London: Baillière, Tindall & Cox; Demy 8vo., pp. 147, with 67 plates and figures in the text. Price: 7s. 6d. net.

ordinary manifestations and to any who wish to have an account of the disease viewed from all angles, we can heartily recommend Dr. Arthur J. Hall's book.¹ The greater part of its contents formed the Lumleian lectures delivered before the Royal College of Physicians, London, in 1923, but later additions to knowledge have been fitted in and a section on treatment has been written.

The subject is treated with academic thoroughness. In an historical survey we are reminded that Bostrom's warning in the Upsala epidemic of 1754 to 1758, "*Mc morbus non novus est*," might well be applied in the present instance and reference is made to the Tübingen *Schlafsucht* of 1712 to 1713. This notwithstanding, epidemic encephalitis as it appeared in 1916 and 1917 was to us practically a new disease. Then follows a brief but very interesting chapter on epidemiology. We are told of the early appearances of the disease; the extent of epidemics; seasonal occurrence; sex, occupation, age and race incidence; its mortality, its infectivity and its relation to epidemic hiccup and like affections, amongst which there is mention of the "X disease" of Australia. Next comes a summary of the findings of those who have worked at the morbid histology, bacteriology and experimental pathology of the disease and this chapter closes with the comment: "It is evident that much further work is necessary before the virus of epidemic encephalitis can be said to have been definitely identified."

In the chapter on clinical manifestations nothing seems to be omitted; the mode of onset, the general symptoms, the lethargy, the localizing signs and symptoms in the nervous system, the mental disturbances, the condition of the blood and cerebro-spinal fluid and the later manifestations or residua, all are adequately discussed.

It is regrettable that notwithstanding all the thoughtful research carried out in connexion with the disease, no definite line of treatment having a curative or preventive action has yet been recognized. Nevertheless it is interesting to read of what has been tried and to cogitate on lines along which progress seems possible. The book concludes with a bibliography which is remarkable for its extensiveness. The first part, practically a reprint of that compiled by Dr. A. C. Parsons for the Ministry of Health in England, gives a list of 1,243 publications which appeared up to the year 1921. Then Dr. Hall, going on with what appeared up to the end of the year 1923, brings the total up to no less than 2,056 publications.

THE NERVOUS PATIENT.

"THE NERVOUS PATIENT" is not Dr. Millais Culpin's first contribution to knowledge of the psycho-neuroses.² He has already written on the "Psychoneuroses of Peace and War" which we reviewed on January 15, 1921. He writes as one who recognizes in Freud's observations a most important contribution to science, but finds them in varying degree acceptable and is therefore content to carry on investigations and hold fast to what experience confirms. He is frank in mentioning that he had been in practice many years before he was seized with the importance of the subject. Indeed his introduction to psycho-analysis was the reading of Dr. Mercier's attack on Freudism, written at a time when he himself as a surgeon was perturbed by the number of patients suffering from hysteria who were to be found in military hospitals, when "hysterical contractures were treated by means of elaborate and expensive instruments or by tenotomies, hysterical vomiting in epidemic form was called gastritis and the patients were drugged with bismuth and fed by means of nutrient enemata" and so on. Now, although this statement of conditions savours of hyperbole, the fact remains that medical education as regards the minor psychoses

was and still is a relatively neglected field. It is, of course, the general practitioner who is deprived of information in this direction, accordingly it is to the general practitioner that Dr. Culpin specially addresses this book. He shows the value of a knowledge of psychological principles, describes states of hysteria, anxiety and obsession, discusses the psycho-pathology of asthma and a number of disorders in which the mental element is of importance, and mentions a number of cases in which psycho-analysis has both illumined diagnosis and assisted treatment. Further, in order to show the relation between psycho-pathology and ophthalmology Mr. Inman has contributed a chapter on this subject and Dr. Stanford Read has sketched the chief points which concern the practitioner in regard to the major psychoses.

While applauding Dr. Culpin's object and appreciating his work, we cannot help questioning whether the contents of his book will be usefully and intelligently grasped by the general practitioner. It is obvious that for a proper understanding of these matters an acquaintance with analysis, unconscious factors and Freudian doctrines and so on is required; this the ordinary practitioner does not possess and can never acquire by reading alone.

DIABETES AND GLYCOSURIA.

TWENTY years ago diabetes was a hopeless subject to the student and practitioner. Even the giant Von Noorden could contribute little more than his famous oatmeal dietary. Now there are many lucid works on this matter and one of the best is Professor Hugh McLean's book, of which the second edition has just appeared.³ The first edition was a model of what such a book should be, the second edition has certain valuable additions. There is little change in the first seven chapters. It is only when dealing with treatment that an entirely new outlook is reached, the outlook afforded by "Insulin." Professor McLean still prefers his titration method of blood sugar estimation to the colorimetric methods of Benedict, more especially in view of the small amount of blood required. It is much more pleasant to submit to the removal of 0.2 cubic centimetres of blood from a finger than one cubic centimetre from a vein, while to the physician the fact of not having to use a colorimeter is an added advantage.

In discussing "Insulin" Professor McLean shows himself a reasoned optimist. He believes, as some workers do not, "once 'Insulin,' always 'Insulin.'"

He emphasizes the importance of blood sugar estimations in using "Insulin," but gives a detailed scheme for its administration (in diabetes, of course, proved to be so by proper tests) without blood sugar estimations.

His method is one which may be easily followed by any general practitioner who will take the trouble to read and digest Chapters IX. and X. and learn how to use food value tables. In fact, the most striking point in these chapters, as in the whole book, is the simplicity. What were abstruse bio-chemical methods and results have been made so simple that any student can understand their meaning and application.

Above all, Professor McLean is no mere laboratory worker. Continually through his books is found an insistence on "the clinical findings," "the general condition of the patient," "the individuality of patients."

The chapters on "Insulin" are admirable examples of this.

The one danger is that he may make the whole thing appear too simple and tempt "fools to rush in." His conclusion is: "The marvellous success of 'Insulin' in the treatment of severe and otherwise hopeless cases of diabetes is one of the most striking triumphs in the whole field of modern therapeutics."

¹ "Epidemic Encephalitis (*Encephalitis Lethargica*)," by Arthur J. Hall, M.A., M.D. (Camb.), F.R.C.P. (Lond.); 1924. Bristol: John Wright and Sons, Limited; Demy 8vo., pp. 241, with 17 plates and other illustrations. Price: 12s. net.

² "The Nervous Patient," by Millais Culpin, M.D. (London), F.R.C.S. (England), with a Chapter on "The Major Psychoses," by Dr. Stanford Read and on "Eye Symptoms," by Mr. W. S. Inman; 1924. London: H. K. Lewis and Company, Limited; Demy 8vo., pp. viii. + 305. Price: 10s. 6d. net.

³ "Modern Methods in the Diagnosis and Treatment of Glycosuria and Diabetes," by Hugh McLean, M.D., D.Sc., M.R.C.P.; Second Edition, Revised and Enlarged; 1924. London: Constable and Company, Limited. Sydney: Angus and Robertson, Limited. Demy 8vo., pp. 191, with thirteen charts and nine figures. Price 8s. 6d. net.

The Medical Journal of Australia

SATURDAY, MARCH 14, 1925.

The Chair of Obstetrics at Sydney.

DURING the past few years the question of the teaching of obstetrics has occupied the attention of many of the leading obstetricians in the chief cities of the Commonwealth. It has been recognized by all that there is a serious defect somewhere. Evidence has been adduced that the maternal morbidity and mortality and the infantile mortality are much too high. The Departmental Committee appointed to inquire into the causes of death and invalidity in the Commonwealth disclosed evidence in 1917 of a high maternal mortality. The fact that 182 women died of puerperal infections in 1915 and 576 others died of various causes connected with the puerperal state suffices to indicate that there is need for some measure of reform. It was pointed out that the untrained and the half-trained midwife were the first responsible factors. The members of the committee found that some of the infections were traceable to inefficiency on the part of medical practitioners. The third factor operating was unhealthy and unhygienic surroundings. The recommendations of the committee aiming at a material reduction of the high maternal morbidity and mortality were firstly the adoption of the advice given by Arnold Lea to diminish carelessness on the part of medical practitioners, secondly the introduction of compulsory notification of infective conditions associated with child-birth, thirdly the control of expectant mothers in pre-maternity clinics, the avoidance of industrial employment of pregnant women and similar measures and lastly the more advantageous expenditure of the money now distributed to women as maternity bonus. Some of these remedies have been adopted more or less widely, but the effect has not been evident.

In more recent discussions of this subject it has been claimed that carelessness or hurry or insufficient primary training of medical practitioners is an

even more important factor than the members of the committee estimated. The medical curriculum has become a full one and, as we have pointed out on many occasions, it entails much waste of energy and loss of time and stands in urgent need of reform in order that the five or six years of student life may be spent to better advantage. Obstetrics has been squeezed in somehow and the training has been unsatisfactory because it has been impossible to introduce a plan based on experience. The demand has thus arisen for reorganization of the course in obstetrics in our three medical schools. The most natural starting point for the reform is to make one competent obstetrician in each University responsible for the planning of the course and for the efficiency of the teaching. In the past a lecturer has been appointed and the practical work has been appended to the attendance at the lectures. Neither the lecturer nor the tutors or clinical teachers could be required to devise the teaching. The student slept through the lectures and witnessed a few deliveries. After graduation he discovered to his dismay that he had not learned how to apply forceps skilfully nor how to convince himself of the relative sizes of the foetal head and the maternal passages without making repeated vaginal examinations. In other words he had to learn his midwifery in practice and he usually learned it from a wrong point of view. It has been said that obstetrics is preventive gynaecology. The general practitioner is not taught how to safeguard the pregnant and parturient woman so that a physiological condition is not converted into a pathological one.

A new era has dawned. The University of Sydney has just appointed Doctor J. C. Windeyer to the chair of obstetrics. Professor Windeyer has the sympathy and support of the whole medical profession in his difficult and important task. As the first Professor of Obstetrics in Australia it is his onerous duty to raise the teaching of preventive gynaecology to the level of an ideal science. He has to determine the minimum requirements for the safe training of students in this branch of medicine and having fixed these requirements, he must be fearless and insistent in refusing to accept

less. He will set an example. Within a short time the Universities of Melbourne and Adelaide must imitate the University of Sydney in appointing either a professor or a director of obstetrics and it is to Professor Windeyer that the other professors or directors will look for guidance. The medical profession is satisfied that the Senate of the University of Sydney has chosen well.

THE NEW PRINTING HOUSE.

OWING to certain unforeseen delays in the completion of the building and in the installation of electric power, the opening of the new printing house of the Australasian Medical Publishing Company, Limited, has been postponed for a couple of weeks. The builders are putting on the finishing touches on the building as we go to press and the greater part of the printing machinery is now erected and is undergoing trials. The staff of THE MEDICAL JOURNAL OF AUSTRALIA will move within a few days and the work will then be transferred to Seamer Street, Glebe.

Members are reminded that the Company has an efficient printing staff and extensive equipment. They are invited to support the company by placing orders for printing of account forms, prescription forms, case cards and the like. They are also invited to visit The Printing House to inspect the premises and their contents.

The first issue of this journal printed at the new printing house will be distinguished by a change in the cover. The design, representing the figure of Æsculapius, appearing on the gold medal of the Federal Committee of the British Medical Association in Australia, will be embodied.

Current Comment.

THE ADMINISTRATION OF ETHER FOR ANÆSTHESIA.

It may be regarded as an established fact that the administration of ether for anæsthetic purposes is frequently, if not always, accompanied by the production of lesions of varying severity in the lungs of the individual. Offergeld's experiments showed that while some cats anæsthetized with ether by the closed method died of broncho-pneu-

monia, the lungs of others killed after two or three days contained small indurated areas comprised of patches of broncho-pneumonia. When the open method was used and the animal was killed at once, injection of submucous vessels was present together with points of hæmorrhage, a little mucus was found in the bronchi and very slight degeneration of the epithelial cells, but not of the alveolar cells. After an interval of two days autopsy revealed a normal condition. The administration of ether for anæsthesia is difficult on account of its inherent irritating effect on the respiratory tract. This is manifested by the outpouring of mucous secretion, by coughing and spasm of the glottis. If the ether is administered slowly, the coughing and spasm of the glottis do not occur owing to the effect on the higher centres of the ether already absorbed into the circulation. Ultimately there comes a stage in anæsthesia at which these reflexes are abolished. If the concentration of ether be carefully regulated during induction, it is usually possible to reduce to a minimum the secretion of mucus from the respiratory tract. The preliminary use of morphine and atropine is often adopted in order to obviate symptoms of irritation. Ether also acts as a stimulant to respiration. It is sometimes used for this purpose as an accessory in the conduct of chloroform anæsthesia. The quickening of respiration during the administration of ether by the closed method is not entirely due to the action of the ether. The patient breathes into a bag and rebreathes the same air. The result is an excess of carbon dioxide and this causes an increased respiratory rate as has been recognized for many years. It will be remembered that the administration of carbon dioxide was one of the therapeutic measures recommended by the Commission which reported on carbon monoxide poisoning in America in 1921 (THE MEDICAL JOURNAL OF AUSTRALIA, November 3, 1923).

Dr. H. W. Haggard who was a member of this Commission, has recently discussed the importance of the volume of respiration during the induction and termination of ether anæsthesia.¹ He states that rapid induction of ether anæsthesia is desirable for the reason that the prolongation of the stages of incomplete anæsthesia is detrimental to the subject. If anæsthesia is to be rapidly induced, it is necessary to administer a concentration of ether vapour much higher than that which is required to maintain complete anæsthesia. The use of high concentration of ether results in disproportionate pulmonary irritation. The only way to limit the irritant action of ether vapour upon the respiratory tract is to employ an ether tension little if any higher than that used for the maintenance of anæsthesia. This will be a long and difficult procedure as absorption is very slow. Dr. Haggard states that a rapid induction can be brought about without an accompanying rise in concentration by increasing the volume of the air breathed. By the inhalation of dilute carbon dioxide a fivefold increase in the volume of respira-

¹ The Journal of Biological Chemistry, April, 1924.

tion can be produced. In his opinion it is safe to use inhalations of 5% to 10% carbon dioxide in air or oxygen. He states that the safety of the inhalation of carbon dioxide is assured by the results which are obtained at the present time in the wide use of a dilute mixture of carbon dioxide in resuscitation after carbon monoxide poisoning and also by its use as a means of rapid etherization after operation. He gives in tabular form the results of two experiments in the induction of ether anaesthesia in dogs. In one a moderate concentration of ether was used and in the other a low percentage of ether was combined with dilute carbon dioxide. The percentage of carbon dioxide used was 7.5. The time required for the production of anaesthesia in the two experiments was practically the same. In the first dog an irregular hyperpnea occurred and a period of very rapid ether absorption resulted. In the dog which received carbon dioxide, the respiratory volume rose until it attained a height four or five times that of normal respirations and was maintained without irregularity. The respiratory volumes decreased as anaesthesia was established. In view of this decrease in respiratory volume as absorption progresses it is not necessary to continue administration of carbon dioxide after full anaesthesia has been produced. In a third experiment Dr. Haggard demonstrated the result of induction of anaesthesia by the combination of concentrated ether vapour and dilute carbon dioxide. Induction in these circumstances is very rapid and no irregularity of absorption occurred. Dr. Haggard states that although the high concentration of ether inhaled must cause more pulmonary irritation than is occasioned by ether at a low concentration, partial compensation can be attained by the relatively brief time over which the highly concentrated vapour is inhaled.

Dr. Haggard's communication is of great practical interest. The beneficial results to be obtained by the use of carbon dioxide in carbon monoxide poisoning have been established beyond doubt. Sayers who has paid much attention to the hazards arising from carbon monoxide, referred to the subject at the Pan-Pacific Congress in Melbourne in 1923. He then expressed the opinion that the subject required further investigation and he held that if too high a percentage of carbon dioxide were given it might be dangerous, for a concentration of 10% would put a strain on the heart. Carbon dioxide is a normal constituent of air in a percentage of 0.03. Sayers has stated that a presence of 2% carbon dioxide increases the ventilation of the lungs by about 50% and that 5% increases it 300%.

Dr. Haggard has evidently not made much practical use in the human subject of the method which he advocates. He states that there are two types of inhalors which could be adapted for this purpose and he hopes that opportunity may be found for the practical development of such an apparatus. It would be of interest and possibly of practical use if a series of experiments similar to those devised by Offergeld were carried out with the method advocated by Dr. Haggard.

MELÆNA NEONATORUM.

THE condition known as *melæna neonatorum* is fortunately of rare occurrence, but when it confronts the medical practitioner, it calls for prompt and energetic action. It is not always that recovery occurs, as was reported in our issue of last week by Dr. Ellen Kent Hughes and Dr. N. Davis and by Dr. A. J. M. Purchas. Many observers hold that *melæna neonatorum* should be grouped with the hæmorrhagic diseases of the new born. Others point out that there is frequently no increase in the bleeding and coagulation times of the blood and that a definite lesion may be found from which hæmorrhage takes place. Many hypotheses have been advanced in connexion with the ætiology of the condition. Thus von Preuschen and Pomorski have reported cases in which *melæna* and pulmonary infarction of apparently spontaneous origin were found in association with traumatic hæmorrhages in the brain which damaged the vasomotor centre. Others have held that venous stagnation results from delay in establishing respiration and that thrombosis leads to embolism and infarction which in turn give rise to ulceration of the stomach or duodenum. Another view which has been put forward, is that the blood vessels are the seat of some disease such as syphilis and, lastly, it has been held that infection by a microorganism is at the root of the matter. In the cases reported in last week's issue no mention is made of any difficulty in the establishment of respiration and, though forceps were applied in one instance, there is no reason to suppose that trauma of any considerable extent was produced.

That *post mortem* examination in fatal cases will probably throw light on the subject is shown by two cases recently reported by Dr. R. L. J. Kennedy.¹ Delivery in the first instance was spontaneous and in the second it was "not difficult." In one instance *melæna* occurred twenty-seven hours after birth and in the other profuse vomiting of blood took place sixteen hours and *melæna* seventeen and a half hours after birth. In the second case the bleeding and coagulation times were normal; in the first they were not recorded. At autopsy in each instance a duodenal ulcer was found. A definite ulcer crater was present and in the centre of the necrotic area an eroded and thrombosed vein was seen. Leucocytic infiltration was found at the margins of the ulcer and in one instance staining by Gram's and Ziehl-Neelson methods of staining failed to reveal the presence of microorganisms in the tissues. Dr. Kennedy refers to observations by Helmholtz in which, though the duodenum appeared normal, microscopical examination revealed necrosis of the mucosa, hæmorrhage and polymorpho-nuclear infiltration of the submucosa. In view of these findings and those described by himself, Dr. Kennedy holds that by more careful search of the gastro-intestinal tract a much larger number of ulcers will be found macroscopically as well as microscopically to explain the occurrence of *melæna neonatorum*.

¹ American Journal of Diseases of Children, December, 1924.

Abstracts from Current Medical Literature.

PÆDIATRICS.

Blood Sugar and Acidosis.

F. B. TALBOT, E. B. SHAW AND M. E. MORIARTY (*The Journal of the American Medical Association*, July 12, 1924) give a preliminary report of investigations of blood sugar and its relation to acidosis in fasting children. The material used was obtained from a series of eight therapeutic fasts carried on for periods varying from six to fourteen days on five patients. These children of apparent normal physical development were treated by fasting for "idiopathic epilepsy." The findings consist of changes in the hydrogen ion concentration of the blood, in carbon dioxide combining power, in blood sugar concentration and in acetone in the breath. A fall in the blood sugar concentration coincident with acidosis was noted. A search through the literature reveals a normal blood sugar content in fasting adults and this rarely falls to seventy milligrammes even though there is a decrease in the alkali reserve. The blood sugar concentration in these children manifested a definite decrease, being more than 50% below normal. The lowest values were found from the third to the sixth day of the fast. This indicates that the glycogen store, easily available for combustion, is more readily exhausted in the child than in the adult and that the body is unable to bring about immediately by glucose synthesis a degree of compensation sufficient to maintain a normal blood sugar concentration. Recent observations on infants who manifested a definite hypoglycæmia as early as fifteen hours after the last food was given, indicate that the younger the child is, the sooner hypoglycæmia will appear. Using the data presented, the authors outline the probable sequence of events. During health the heat energy of the body is derived principally from the combustion of carbohydrate and to a lesser extent from fat and protein. Under these conditions there is a great excess of anti-ketogenic material. During fast, however, as no carbohydrate is obtained from food, the store of available carbohydrate is quickly exhausted. The heat energy, then, must come from fat and to a lesser extent from protein. There is now a great excess of ketogenic material. There is in consequence a great production of ketones. The ketone acids then combine with the alkali of the blood and reduce the carbon dioxide combining power. This decrease in the alkali reserve is accompanied in the authors' patients by a diminished alkalinity of the blood. If this sequence of events is correct, then acidosis during fasting with non-diabetic children is due to lack of available sugar and this is manifested by a low blood sugar content. The authors conclude that when a ketosis is found, it must be

assumed that there is some interference either with the availability of the sugar or with the ability of the body to oxidize sugar. If the body is able to oxidize sugar, as is the case with these fasting children, then the ketosis must be due either to a sugar deficit or else to a lowered availability of the sugar deposits of the body. The low sugar concentrations found during fasting give the underlying reason for the efficiency of glucose in the treatment of acidosis.

The Calcium Metabolism of Infants.

BENGT HAMILTON (*Boston Medical and Surgical Journal*, August 21, 1924) discusses some aspects of the calcium metabolism of infants. Reports on the calcium metabolism of normal breast-fed infants show that the retention of calcium on the whole increases as the infants grow older. In regard to calcium retention per kilogram the infants may be divided into two groups: infants less than three months old and infants above that age. In each group the values are moderately constant. At the age of three months there seems to be a sudden increase in the retention per kilogram, as well as in the total amount of calcium retained. The relative calcium content of the body as a whole decreases after birth, but it is still undetermined how or where the decrease takes place. It has been assumed by several writers that the body at birth contains an excess of calcium which has been stored during the last months of fetal life. The decrease of the calcium content of the body may be interpreted as indicating the gradual consumption of this excess. According to the author's calculation the excess would be consumed at the age of three or four months. This is the age at which there is a sudden increase in the calcium retention. After that time all the calcium needed for growth would have to be retained from the milk. When the stored calcium is consumed, inability to utilize properly the calcium intake would result in an insufficient supply of calcium for growing bones. It is reasonable to suppose that the intake in normal infants on breast milk is adapted to the requirements. The amount of calcium which daily passes through the body of such an infant, may be supposed to correspond approximately to the amount needed for maintenance. In the first month of life the greater part of the intake is used for maintenance, only 17% to 30% being retained. The calcium output is also fairly constant and without relation to calcium intake. In prematurely born infants there is low calcium content of the body at birth. Rapid growth follows with abnormally low calcium retention. The writer found in his study of premature infants that these usually did not retain any appreciable amount of calcium as long as the calcium intake was less than two hundred milligrammes of oxide of calcium daily. The function of the calcium passing through the body is at present practically un-

known. It is recognized that this constant flow of calcium is necessary. It is obvious that an increased demand for calcium needed for maintenance would make less calcium available for the growth of bone.

Hæmorrhage in the New-Born.

J. N. CRUIKSHANK (*The Lancet*, October 18, 1924) discusses the causes and treatment of hæmorrhage in the new-born infant. He alludes to the hæmorrhage which often occurs in asphyxiated babies after prolonged labour, which may be prevented by not allowing an unduly long labour and may be treated by allowing some blood to flow from the cord before tying it. Traumatic hæmorrhage is not generally suitable for surgical intervention. Spontaneous hæmorrhage occurs without any obvious cause and is generally associated with prolongation of the coagulation time and the bleeding time; melæna and hæmatemesis are the commonest manifestations of spontaneous hæmorrhage. Syphilis and sepsis are common causes of hæmorrhage in the new-born. Bleeding occurs less frequently from the umbilical stump, into the brain and other viscera and into the skin. To test the coagulation time a drop of blood is allowed to flow from a puncture in the heel into a watch glass containing a small lead shot, a second watch glass is placed over the first to prevent evaporation. The glasses are moved from time to time to see if the shot will roll to and fro. When the shot ceases to roll the blood is coagulated. Normally in new-born infants this occurs in five to ten minutes. In cases of hæmorrhagic disease it may be prolonged to half an hour or more. Normally the bleeding time is two to five minutes. The skin of the heel is pricked and the drops removed with filter paper as they appear. If they continue to do so for more than five minutes, there is an increase in the bleeding time. The puncture may go on oozing for hours or days in cases of hæmorrhagic disease. As soon as the diagnosis is confirmed in this way an injection of whole blood should be made either subcutaneously or intravenously. In the former method ten to twenty cubic centimetres of blood are drawn into a twenty cubic centimetre syringe from a vein in the donor's arm. The application of a tourniquet assists the flow of blood; this blood is at once injected into the lower layers of the subcutaneous tissues of the infant in the mid-scapular line. The puncture is sealed with collodion and the area massaged for a minute or two. This method is very successful if carried out early enough. Even greater success is claimed for the intravenous injections. A cannula with a short rubber tube attached is inserted into the donor's vein and clamped; as much blood as is required can then be drawn off at once into a special vessel or repeatedly into a twenty cubic centimetre syringe containing two cubic centimetres of a 10% solution of sodium citrate. The blood is introduced into the superior

longitudinal sinus or one of the scalp veins of the infant, a cannula with a clamped rubber tube being inserted into the vein if more than one syringeful of blood is to be introduced. Ideally the donor's blood should not react to the Wassermann test and the group should be determined. If these procedures cannot be carried out the mother's blood should be used. The compatibility test can be carried out simply by withdrawing a few drops of the infant's blood into a capillary tube or a Wright's capsule. This is centrifuged to separate the serum and a large drop of the serum is transferred to a slide by means of a pipette moistened with citrate solution. To it is added a small drop of the donor's blood and a cover slip is put on. If no agglutination of corpuscles is seen under the microscope at the end of five minutes the specimens of blood may be regarded as practically certain to be compatible. In addition to the above methods warmth, food and plenty of fluid should be given by the mouth.

ORTHOPÆDIC SURGERY.

Fractures of the Hip.

H. W. MEYERDING (*Surgery, Gynecology and Obstetrics*, March, 1924) reviews the problems involved in the treatment of fractures of the hip. The most effective treatment is undoubtedly the Whitman method. It allows correct reduction and fixation, but demands a knowledge of plaster of Paris technique. The use of an anæsthetic and of an orthopædic table is found a valuable aid in the reduction and the application of the cast. The author states that the duration of fixation in plaster should be at least six months. *Coxa vara* and non-union are often the result of too early weight bearing. Once such deformity has appeared conservative treatment is of little value. Open operation, osteotomy and prolonged post-operative fixation are not always advisable and deformity has often to be expected. In cases of non-union in a suitable subject for operative interference the unabsorbed femoral neck may satisfactorily be treated by bone grafts. When there is absorption of the neck, the operations of Bracket and Whitman are advised.

Arthrodesis of the Tarsal Joints.

ALEXANDER MACLELLAN (*British Journal of Surgery*, October, 1924) has devised an arthrodesis for those cases of paralytic feet in which there is a great discrepancy in the length of the two limbs. The operation is carried out as follows. A tarsal incision is made to the outer side of the long flexor tendon of the great toe. It extends obliquely upwards from the space between the heads of the first and second metatarsal bones of the lower tibio-fibular joint. This incision reaches down to the bones and the first and second bones are separated by the knife from each other. A saw or osteotome is then

inserted and the cuneiform, scaphoid and talus are split vertically. The split in the foot is then forcibly widened and the various joints are erased by the osteotome and sharp spoon. A difficulty will be found in rendering the obliteration of the talo-cuneiform joint. Deep ligatures are not usually required, but a few subcutaneous catgut sutures may be inserted. The foot is put up on a lateral, straight, wooden splint until the sutures are removed when a plaster of Paris casing is applied. Walking is encouraged at the end of six weeks and a celluloid splint is fitted to maintain the position. The author has performed seven operations and in no instance have there been any untoward symptoms. When fixation has been achieved, an artificial boot may be made so as to distribute the pressure between the projecting heel and the balls of the toes. The children walk without a support of any kind other than a stiffened boot.

Synovectomy in Chronic Infective Arthritis.

PAUL P. SWETT (*Journal of Bone and Joint Surgery*, October, 1924) makes a further report on his method of treating chronic infective arthritis by synovectomy. He applies the operation to that form of arthritis which is a chronic poly-articular disease characterized by the usual constitutional features of chronic infection accompanied by progressive inflammatory changes in the soft tissues and affecting the cartilage and bone only secondarily, if at all. He does not propose to try the radical treatment until conservative measures have been exhausted. The most promising patients are those in whose joints effusion and coarse crepitation persist without great loss of joint movement. After the active process has been arrested the operation consists in opening the joint at the site of greatest effusion and capsular thickening and then with scissors and forceps dissecting out all the diseased inner layers of the synovia down to what appears to be healthy tissue. Occasionally the knee is approached through a semicircular incision transecting the patella tendon just below the patella. In justifying this second approach, the author is not certain that early movement is important. When the dissection is finished the joint is dried and closed in layers without drainage. There is no post-operative fixation. At the end of two weeks baking and light massage are prescribed and weight bearing is allowed as soon as pain and spasm permit. Three theoretical considerations led the author to try this operation: (i.) The possibility that the removal of the inflammatory exudate and its products might permit the return of joint function; (ii.) the hope that the removal of the secondary foci of infection in the joints might aid the patient to overcome the disease; (iii.) the idea that early resumption of joint function with its concomitant increase in joint activity might provide the best

stimulus to metabolism. The author has subjected twenty patients to operation and the joints treated were one wrist, three elbows and twenty-six knees, making a total of thirty. There were no operative complications or sequelæ. In seventeen of these patients the result has been prompt return of comfortable movement without subsequent relapse. The removal of the diseased tissue does not appear to have benefited patients in respect to other joints.

Metatarsus Primus Varus or Hallux Valgus.

WALTER TRUSLOW (*Journal of Bone and Joint Surgery*, January, 1925) subjects the condition classified as *hallux valgus* to critical examination. The greatly distorted forefoot which is usually named *hallux valgus*, he names *metatarsus primus varus*, because of the oblique position of the first metatarsal bone when there is no deformity of the metatarsal heads. Study of skiagrams reveals a distinct divergence of the first metatarsal bone from the second, a wedging either from the internal cuneiform bone or the proximal end of the metatarsal or the presence of a wedge-shaped intermetatarsal bone. These changes are not due to pathological changes as the wedged bones are found histologically to be normal. The author is of the opinion that it is a definite variation in the structure of the bones and is not pathological. There may, however, be pathological changes at the metatarsal heads, such as spurs, bony outgrowth, bridging, ankylosis or enlargements of the sesamoid bones. The author's operative treatment consists in a cuneiform osteotomy of the redundant bone wedge at the metatarsal-cuneiform joints. He also performs tenotomy on the shortened long extensor tendon and carries out a subperiosteal separation of the contracted parietal capsule of the metatarsophalangeal joint. After this is done the patient may begin to put weight on the foot in two weeks. A foot brace should be worn for three months and for longer if definite flat foot or metatarsal proneness persists. A description of the foot brace is given. In complicated cases any bone blocking structures between the heads of the first and the second metatarsal bones must also be removed. For example, it is necessary to deal with sesamoid bones and enlargement of the parietal and plantar sides of the metatarsal heads.

Fracture of the Clavicle.

F. W. MCGUIRE (*Surgery, Gynecology and Obstetrics*, December, 1924) describes an apparatus for the treatment of fracture of the clavicle. This apparatus is an abdominal support laced back and front which compels the patient to stand erect. From the back of the support spring two bands which grip the shoulders and hold them back. The inner fragment is held in position by a pad and a strip of adhesive plaster; the arm is bandaged to the side. He claims for the method efficiency and comfort.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE QUEENSLAND BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Brisbane General Hospital on February 5, 1925, Dr. V. McDOWALL, the President, in the chair.

Post-Graduate Work.

The following notice of motion was given by Dr. E. S. MEYERS:

That this Branch arrange for a post-graduate course to be held in Brisbane during the winter months and that the Council be requested to make the necessary arrangements.

Motion of Condolence.

Dr. V. McDOWALL, the President, proposed a motion of condolence with Dr. J. S. C. Elkington on the loss of his wife. This was carried in the usual manner.

Gumma of the Tongue.

Dr. NEVILLE G. SUTTON showed a boy, aged twelve years, who had been seen in September, 1924, and had given a history of a sore tongue of six weeks' duration. A painless ulcer had been present on the dorsum of the tongue. It had been three centimetres long and one and a half centimetres in depth. The ulcer had been fissured and had presented a sloughing base. There had been slight induration and some enlargement of the glands. A small superficial ulcer had been present in front of the larger one. No reaction had been obtained to the von Pirquet test and the response to the Wassermann test had been described as "++++." Dr. Sutton pointed out that the child was one of a family of nine children. All the other members of the family were quite healthy; the patient had never been well. Four months prior to the appearance of the lesion on the tongue he had suffered from a periosteal swelling over one tibia which had been incised. X-ray examination at this time had revealed considerable periosteal reaction. The patient had been given mercury and iodides together with cod liver oil and malt. He had already gained 3.1 kilograms in weight. At the time of demonstration the ulcer was nearly healed.

Aneurysm of the Ascending Aorta.

Dr. A. P. MURPHY showed a man, aged forty-seven years, who had fainted suddenly three and a half years previously whilst straining at work. An aneurysm of the ascending aorta had been discovered. Dr. Murphy pointed out that the chest wall was bulging on the right side and that the superficial abdominal veins had recently become greatly enlarged. The patient had occasional anginal attacks. A bruit could be heard over the aneurysm, but no adventitious sounds were audible nor were any signs of aortic incompetence in evidence. Dr. Murphy said that the condition was interesting on account of the length of time which had elapsed since the onset of symptoms. Boyd in a recent review had stated that of one hundred and eighty patients only eighty were alive three years after diagnosis of the condition.

Hæmochromatosis.

Dr. EUSTACE RUSSELL read a paper entitled: "Hæmochromatosis" (see page 251).

Dr. E. S. MEYERS said that he had a patient, a man, aged forty-five years, who was suffering from wasting, polyuria and thirst and who had a bronzed appearance. The patient also had enlargement of the liver and spleen. This man was probably suffering from "bronzed diabetes." The blood sugar percentage was 0.28 and diacetic acid was present in the urine. He asked Dr. Russell what the blood sugar percentage was in his patient.

Dr. J. V. DUBIG said that spectroscopic examination of the blood revealed the presence of hæmoglobin. Microscopical examination of a piece of skin disclosed the presence of hæmosiderin in the cells.

Dr. Russell in reply said that the differential diagnosis between hæmochromatosis and Addison's disease rested in early cases of the latter on pigmentation of the mucous membrane and the loss of blood pressure. The aetiology of the condition was unknown. Alcoholism and gastrointestinal diseases were predisposing factors, while syphilis apparently was not a cause. He was unaware of the state of the blood sugar when the patient was suffering from hypoglycæmia. It did not, however, fall below the normal renal threshold. In the second patient the blood sugar percentage was 0.1 and no abnormality was present in the urine.

Mixed Celled Sarcoma in the Fundus of the Sac of an Inguinal Hernia.

Dr. C. J. WEEDON presented a man who had suffered from an inguinal hernia of twenty years' duration. A swelling had appeared in the hernia and had prevented him from wearing a truss. The swelling had been regarded as either an enlarged inguinal gland or a piece of incarcerated and indurated omentum. At operation the mass which was the size of the tip of the thumb, had been found fused with the end of the sac. On incision of the sac fluid had escaped and some induration had been felt near the caecum. A bismuth meal had failed to reveal any abnormality. Microscopical examination of the mass had shown it to be a mixed celled sarcoma.

Dr. N. G. SUTTON asked whether this could be regarded as a secondary deposit by gravity from some focus in the abdomen, as was often seen with carcinoma.

Dr. J. V. DUBIG said that the mass arose from the peritoneum and might have been due to chronic irritation of the truss. It represented a low grade of malignant disease and was eminently suitable for X-ray therapy. He did not think that it was a gravity implantation as sarcoma was a more infiltrating growth than the proliferated type seen in carcinoma.

Diagnosis by Analysis of Urine.

Dr. A. G. ANDERSON showed a report on an examination of urine issued by a chemist in Brisbane who advertised largely that he could diagnose all diseases by this means. The patient suffered from pulmonary tuberculosis and possibly abdominal tuberculosis. Otherwise he was normal. The report was as follows:

"General appearance—normal with leathery deposits of urates.
Odour—Putrescent.
Sp. Gr.—1.011.
Albumen—Nil.
Serum albumen—Yes.
Alkaline phosphates—Very heavy quantity.
Earthy phosphates—Present.
Uric Acid—Crystals of this acid: deposit after 72 hours.
Hydrochloric acid of stomach—Normal.
Cyanosis—Very bad indeed.
Urates—Catarrhal.
Sugar—Trace.
Acidosis—Very advanced.
Toxins—Febrile.
Cleavage products—Quantity.
Diagnosis—Ulcer of stomach.
Fee £1/1/- . This disease can be treated for 30/- a month."

Carcinoma of the Pancreas.

Dr. A. G. ANDERSON showed a man, aged sixty years, who had complained of pain in the epigastrium for six months with repeated attacks of hæmatemesis and vomiting of food, especially meat. He had lost 11.6 kilograms (two stone) in weight in nine months. No mass had been palpable. By X-ray examination no six-hour residue had been found in the stomach, hypertonus had been present with a broad hour-glass stomach and rapid emptying. A diagnosis of malignant disease of the pylorus or of the prepyloric region had been made. At operation the stomach had appeared normal, though its veins and those of the omentum had been enormously dilated. A large and indurated, nodular mass had been found growing from the

body and tail of the pancreas. No glands had been palpable and the abdomen had been closed. Dr. Anderson said that the cause of the hæmatemesis might have been pressure of the growth on the lienal vein and increased flow through the *vasa brevia* of the stomach.

Dr. V. McDOWALL said that the irregularity in outline of the stomach was apparently due to pressure of the enlarged veins. The rapidity of emptying was typical of a gaping pylorus, due generally to induration.

Dr. A. P. MURPHY said that the diastatic content of the fæces might have been estimated in coming to a definite diagnosis.

Dr. J. V. DUHIG said that in addition to this the carbohydrate tolerance should also be tested in order that a lowering or otherwise might be determined.

Lymphatic Leuchæmia.

Dr. J. W. FORD showed a man, aged twenty-nine, a colour printer by trade, who complained of painful swellings in the neck and groin, cramps in the legs, discoloured patches on the legs and of pallor, weakness and breathlessness. A swelling had first been noticed five months previously. The patient was a returned soldier and his previous history beyond the fact that his leg had been amputated below the knee, was uneventful. Dr. Ford pointed out that multiple enlarged glands were present on both sides of the neck. The glands were discrete and not adherent to the skin or deep structures. The right sub-maxillary gland was much enlarged and painful. Both the axillary and inguinal regions contained enlarged, discrete and painful glands. No abdominal glands were palpable. Increased hilar shadows had been found on X-ray examination of the chest. The serum had not reacted to the Wassermann test. Examination of an excised gland had revealed the presence of a large number of small cells which were most likely lymphocytes. The erythrocytes numbered 3,150,000 per cubic millimetre. The hæmoglobin value was 60% and the colour index 0.9. The white cells numbered 32,700 per cubic millimetre and were composed of 7.5% neutrophile cells, 3.5% eosinophile cells and 89% small lymphocytes. Punctate basophilia and anisocytosis were present.

Ulnar Causalgia.

Dr. E. S. MEYERS showed a male patient, aged twenty-four years, whose right ring and little fingers had been severed by a band saw in June, 1922. He had subsequently suffered from intense pain in the region of the scar and in the forearm. Two years after the accident the ulnar nerve had been exposed and injected with carbolic acid in its upper third. This had afforded some relief for four months. On the patient's admission to hospital in January, 1925, he had suffered from intense pain in the scar and forearm. In addition paralysis of the adductor muscles of the thumb and of the interossei muscles had been traced. It had been decided to divide the nerve and resuture it in the way described by Delagénère. Dr. Meehan who saw the patient, had been of the opinion that this would be the best treatment. At operation the nerve had been found thickened and of a grey red colour. Immediate relief from pain had occurred after operation and there was no recurrence up to the time of demonstration.

Dr. A. V. MEEHAN said that these patients generally suffered from burning pain with sensation of heat. The condition occurred in nerves with many sensory fibres, especially the ulnar and posterior tibial nerves. Injections of alcohol and diathermy gave temporary relief only. Division of the nerve should be reserved for patients who had severe symptoms and whose condition had been definitely diagnosed. In some instances the trouble had recurred after resection, but had disappeared after a second division and resuture.

Myeloma of the Mandible.

Dr. A. V. Meehan also showed a patient who had suffered from myeloma of the mandible. The man had been punched on the jaw while fighting. A lump had been noticed a few weeks later and had slowly grown for three years. Dr. Meehan had operated inside the mouth and had removed the outer and upper walls of the cavity.

A moderate amount of solid growth had been scraped out. There was still some disfigurement of the face. Dr. Meehan said that he had shown the patient to emphasize the fact that these tumours were not malignant.

Ununited Fracture of the Neck of the Femur.

Dr. A. V. Meehan read the notes and showed the skiagrams from a case of ununited fracture of the neck of the femur in which he had used a grown graft. (This case will be reported in a subsequent issue.)

Skiagrams.

Dr. V. McDOWALL showed several interesting skiagrams of cystic and fibro-cystic bony growths, such as Brodie's abscess, exostoses, myeloma and *osteitis deformans*.

NOMINATIONS AND ELECTIONS.

THE undermentioned have been nominated for election as members of the New South Wales Branch of the British Medical Association:

- Edwards, Colin, M.B., Ch.M., 1924 (Univ. Sydney), "Armidaire," Victoria Street, Ashfield.
Shute, Redvers Buller, M.B., Ch.M., 1923 (Univ. Sydney), 103, Macleay Street, Potts Point.
Stormon, Edward Ambrose, M.B., Ch.M., 1923 (Univ. Sydney), Willoughby Road, Naremburn.
Will, Ewan Murray, M.B., Ch.M., 1923 (Univ. Sydney), Greenknowe Avenue, Potts Point.

University Intelligence.

THE UNIVERSITY OF SYDNEY.

A MEETING OF THE SENATE OF THE UNIVERSITY OF SYDNEY was held on March 2, 1925.

A petition of representatives of dental associations of New South Wales to the Senate for the establishment of a doctorate of dental science was referred to the Professorial Board.

A letter was received from Mr. G. H. Bosch, forwarding a cheque for £2,000 as a contribution to the Cancer Research Fund. It was decided to send a letter of grateful thanks.

The Senate had under consideration a report from the Committee of Advice in England regarding the applications for the Chair of Obstetrics. The Home Committee reported that Dr. J. C. Windeyer who has hitherto held the lectureship in obstetrics, has been unanimously selected as the first choice of the candidates. Acting on the recommendation, the Senate has appointed Dr. Windeyer to the Chair as from March 1, 1925.

Dr. Windeyer was educated at King's School, is a graduate of the University of Sydney and holds in addition the joint qualification of M.R.C.S. (Eng.) and L.R.C.P. (Lond.). He studied gynecology under Dr. Herbert Spencer and obstetrics under Dr. Blacker at University College Hospital, London. He has spent some considerable time in the study of obstetrics and gynecology in Vienna, Dublin and in various other hospitals in Europe and America. In 1904 he was appointed honorary assistant surgeon to the Royal Hospital for Women and since 1906 has had full charge of the obstetrics beds in that institution. He was assistant surgeon to Dr. Foreman during the past fifteen years on the staff of the Sydney Royal Hospital for Women and during the past five years has been full honorary surgeon in the gynecological wards. In 1918 he was selected by the late Sir Thomas Anderson Stuart as acting lecturer in obstetrics and in 1920 was appointed to the lectureship on the resignation of Dr. Fourness Barrington. Dr. Windeyer has published many

original papers in obstetrics and gynaecology which have appeared in medical journals and transactions of medical courses.

A letter was received from Professor Grafton Elliot Smith, Professor of Anatomy in the University of London, reporting that he had sent to the University certain documents formerly the property of the late Sir Charles Nicholson, which he had been instructed to present to the University of Sydney. These papers which are highly prized by the authorities, include correspondence and notes relating to the foundation of the University, the design of the earlier buildings, the Charter, the coats of arms, the stained glass windows in the Great Hall and the policy of the University. These records will be housed in the archives of the Fisher Library and may serve in the near future as material for research students. The Senate decided to thank Professor Elliot Smith and the representatives of the family of the late Sir Charles Nicholson for the valuable gift.

Further messages of sympathy regarding the loss of Professor Hunter were received from the Academy of Medicine, Toronto, and the American College of Surgeons.

Acting on the recommendation of a Committee of Advice in London, consisting of Professor J. T. Wilson, Professor of Anatomy at Cambridge, Professor Elliot Smith and the Vice-Chancellor, Professor MacCallum, the Senate decided to offer the Chair of Anatomy to Professor Davidson Black who is at present Professor of Anatomy at the Pekin Medical College, China. The Committee of Advice considered that Professor Black who is a graduate of the University, Toronto, is not only the most efficient candidate for the chair, but has the same interests as the late Professor Hunter. He is considered to be an anatomical expert, a good teacher and one who is likely to carry on the research work so ably conducted by the former occupant of the chair. Before the war he was Assistant Professor of Anatomy of Western Reserve University in the United States of America. He served with the Canadian Military Forces during 1917 to 1919 and from 1918 he has been professor of Anatomy at the Pekin Union Medical College.

The following appointments and re-appointments were made.

- Dr. I. W. Wark—Lecturer and Demonstrator in Chemistry.
- Mr. H. E. Dadswell—Demonstrator in Organic Chemistry.
- Dr. L. J. Shortland—Honorary Demonstrator in Anatomy.
- Dr. S. A. Smith—Lecturer in Neurology.
- Messrs. A. C. T. Kellick, J. D. McElroy, W. J. Greenfield and E. Barden—Demonstrators, Department of Chemistry.
- Mr. G. H. Godfrey, M.A.—Lecturer in Physics.
- Mr. V. R. Clifton, B.Sc.—Demonstrator in Physics.
- Mr. I. Clunies Ross, B.V.Sc.—Lecturer in Veterinary *Materia Medica*, Veterinary Parasitology and Veterinary Pharmacy.
- Mr. Max Henry—Lecturer in State Sanitary Science.

Medical Societies.

THE MEDICAL SCIENCES CLUB OF SOUTH AUSTRALIA.

A MEETING OF THE MEDICAL SCIENCES CLUB OF SOUTH AUSTRALIA was held at the University of Adelaide on November 7, 1924.

Treatment of Rickets.

PROFESSOR BRAILSFORD ROBERTSON drew attention to a discovery reported in *Science* that all those substances which had a curative effect on rickets were capable after treatment with oxygen of blackening a photographic plate exposed at a short distance from them. The effective rays which issued from these substances, passed through

quartz, but did not pass through glass. They appeared, therefore, to be ultra-violet radiations. It was of interest in view of the analogy afforded to the Baly theory of photo-catalysis, to note that irradiation by these substances with ultra-violet light led to the disengagement of oxygen from them. Since light was known to have a curative effect upon rickets, the possible origin of this fact was to be sought in the absorption of the light by substances in the skin similar in character to these curative agents which then became capable of liberating the radiant energy elsewhere.

PROFESSOR KERR GRANT pointed out that if this were the case, it might be possible to administer curative agents through application to the skin.

DR. H. MAYO AND DR. A. A. LENDON asserted that this had been a common practice in the case of cod liver oil for very many years.

DR. R. HONE pointed out that treatment of rickets with light alone was frequently ineffective unless cod liver oil were administered simultaneously.

MR. R. MARSTON suggested that the reason for this might be that not only was activation by light of some substances necessary, but also a sufficiency of substances capable of being activated which might be supplied by the cod liver oil.

The Basal Metabolic Rate.

DR. C. FINLAYSON demonstrated the Douglas-Haldane apparatus for determining metabolic rate and explained the application of the findings obtained with this apparatus to clinical diagnosis.

Enlargement of the Thymus.

DR. H. MAYO reported a case of enlarged thymus in an infant three and a half months old. The child, seemingly normal, had been admitted to hospital, where it died very suddenly. At *post mortem* examination the thymus had been found to weigh eighteen grammes. No other abnormality had been evident. Dr. Mayo pointed out that as early as 1885 the presence of an enlarged thymus had been noticed to be associated with sudden death in infants. The cause of death was evidently not mechanical obstruction of breathing.

Dr. Mayo exhibited two X-ray films of the thorax of children, one of which was normal, the other showed enlargement of the thymus or of the heart. The picture did not enable a decision as to which organ was affected. In the patient from whom the latter film was taken, rapid breathing was evident.

DR. F. H. BEARE considered the condition one of thymic asthma. The child when he saw it, had been breathing at the rate of about 100 to the minute. Indrawing of the diaphragm had been present. The child had been cyanosed and had presented other evidence of respiratory distress.

PROFESSOR J. B. CLELAND pointed out that the indrawing of the diaphragm suggested pressure on the trachea.

Diketopiperazine.

MR. R. MARSTON exhibited a specimen of a diketopiperazine, an amino acid anhydride which had been obtained from casein by acid hydrolysis in the presence of ether emulsified with it at low temperature. He pointed out that these cyclic structures occurred in the protein molecule and he showed how their presence might account for many of the properties of proteins which were unexplainable by the conventional catenary or chain-like structure of the protein molecule. The presence of these cyclic structures in the protein molecule had also been lately demonstrated by E. Abderhalden.

Nerve Supply of Smooth Muscle.

DR. O. W. TIEGS exhibited a preparation which revealed the existence of a continuous nerve network in the smooth muscle comprising the *retractor penis* of the dog. Transmission of impulses from fibre to fibre of the smooth muscle might, therefore, occur through the agency of this network.

Correspondence.

"THE ANATOMY OF PROCIDENTIA UTERI."

SIR: I am obliged to Dr. Worrall for the information that his remarks on Mr. Maguire's paper on procidentia referred to vaginal operations only.

He adds, however, that: "Quotations without the context are apt to be misleading." I have carefully re-read his remarks in the "Transactions of Congress," as published in the Supplement to THE MEDICAL JOURNAL OF AUSTRALIA on March 29, 1924, at page 175 and I cannot find a single line in the whole context to indicate that he was referring to vaginal operations only in discussing the subject. On the contrary, he specifically mentions "abdominal operation"; so that, as far as the context is concerned, the interpretation I put upon it was the only one possible under the circumstances, as a reference to the article itself will clearly show.

However, I am pleased to accept Dr. Worrall's disclaimer and to learn that he now regards "shortening the fibro-muscular tissue and bringing it together in front of the cervix" as the essential principle in the treatment of procidentia.

Yours, etc.,

FRANK A. NYULASY

Melbourne,

February 23, 1925.

OVERDOSES.

SIR: During this week we received a prescription at one of our pharmacies late in the afternoon which included a twenty-five minim dose of tincture of belladonna for repeated administration.

We endeavoured to get into touch with the prescriber who had left his rooms and who had not arrived home when the hour of legally compulsory closing approached. As the whole onus of responsibility is thrown on the pharmacist by the present British Pharmacopœia, we dispensed the maximum legal dose and on the following morning advised the physician of what we had done. He took exception to our action and challenged our right to reduce his dose which was officially an overdose.

We pointed out that if he had initialled this overdose thus accepting the responsibility for any possible untoward effect, we should not have hesitated to carry out his wishes. But until he is prepared to accept this responsibility and signify his acceptance in some manner capable of legal proof, we advised him that we were not prepared to take the risk of legal proceedings which would succeed against us and leave him free from all responsibility, expense and disgrace. We are not expressing any opinion as to whether the maximum legal dose is too low. To give such an opinion would be outside our province.

But may we suggest that every member of the medical profession (when in his opinion the maximum dose should be exceeded) can always obtain the exact execution of his wishes if he will merely initial such overdose on his prescription?

Yours etc.,

H. FRANCIS & Co.

280, Bourke Street, Melbourne,
February 20, 1925.

ARTERIO-SCLEROSIS AND MENTAL DISEASE.

SIR: I have perused with keen interest the paper on the above subject read by Drs. North and Bostock in Sydney in October last and published in your journal of the fourteenth instant. The subject of blood pressure is one in which I take a keen interest and my Society (The Temperance and General Mutual Life Assurance Society) has been taking blood pressure records for some considerable time now and if they are of any service, I attach hereto the results of an investigation of the readings of propo-

ents who were medically examined during the period July 1922 to July 1924. The ages at entry are not quite the same as those given in the table, but for illustration purposes they can fairly easily be compared. You will note that the total number of cases examined were 6,035 which gives especially in the groups between 20 and 50, a sufficiently large number to give a fair average. You will note that the figures vary slightly from the other figures quoted in the paper.

We also took out the figures separately for each of the States of the Commonwealth and New Zealand with a fair amount of fluctuation. This, however, may be only due to comparatively few cases in each State.

If the figures are of any value to the authors of the paper, we shall be glad to send them.

Yours, etc.,

H. M. JACKSON.

Actuary.

The Australasian Temperance and General Mutual Life Assurance Society, Limited,
Melbourne,

February 18, 1925.

TABLE SHOWING THE RESULTS OF AN INVESTIGATION OF BLOOD PRESSURE READINGS OF PROPONENTS FOR ASSURANCE MEDICALLY EXAMINED DURING THE PERIOD JULY, 1922, TO JULY, 1924.

Ages.	Number of Cases.	Average Systolic Blood Pressure.	Average Diastolic Blood Pressure.
Under 20	431	119.0	77.6
20 to 29	1,807	124.0	81.3
30 to 39	1,686	126.4	84.3
40 to 49	1,577	130.5	85.7
50 to 59	474	134.5	86.3
60 and over	60	138.1	88.1

FRACTURE OF THE SKULL.

SIR: As I have a real respect for Dr. Hipsley, he will, I hope, forgive me for objecting to his speaking of the symptoms of fracture of the skull. This condition causes no symptoms. How could it? Symptoms may be associated with fracture of the skull or they may not. Even in a depressed fracture symptoms may be caused by the depression, but not by the fracture. Perhaps the distinction may be considered unimportant. I do not think so. Logical thought and clear expression are never unimportant. As a student I was compelled under silent protest to learn the symptoms of cranial fracture; but that is no reason why I should acquiesce in this teaching being passed on to the next generation.

Yours, etc.,

A. JEFFERIS TURNER.

Brisbane,

February 23, 1925.

DEEP X-RAY THERAPY.

SIR: It is difficult to let pass without comment some of the curious statements made by medical men as regards the efficacy of deep X-ray therapy. Having had experience in radio-therapy for sixteen years and having seen its growth from the period when the thinnest of filters were used up to the present use of filters two millimetres and over, I feel that I am entitled to express an opinion.

In the early days accurate measurement was impossible, now it is an accomplished fact. This statement, as Dr. Flecker points out in THE MEDICAL JOURNAL OF AUSTRALIA of February 28, 1925, can be mathematically proved by calculations from Dessauer's charts. Seeing that a correct and definite dose can now be administered, surely its

biological effects can be better controlled than under the old system. It would hardly be exaggeration to assert that we know more as regards the biological effects of a definite X-ray dose than is at present known of the effects of many medicinal drugs.

Wild statements are always promulgated over any innovation or marked improvement which are apt to retard its progress, but no worker in any branch should object to fair criticism from an entitled source.

Yours, etc.,

F. EMRYS-JONES.

71, Collins Street, Melbourne.

February 28, 1925.

Books Received.

- BASAL METABOLISM IN HEALTH AND DISEASE**, by Eugene F. Du Bois, M.D.; 1924. Philadelphia and New York: Lea and Febiger. Royal 8vo., pp. 372. Illustrated with 79 engravings. Price: \$4.75.
- THE FOUNDATION OF HEALTH: A MANUAL OF PERSONAL HYGIENE FOR STUDENTS**, by William Barnard Sharp, S.M., M.D., Ph.D.; 1924. Philadelphia and New York: Lea and Febiger. Demy 8vo., pp. 256, with illustrations. Price: \$2.50.
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- RHEUMATIC HEART DISEASE**, by Carey F. Coombs, M.D., F.R.C.P. (London), with an Introduction by F. J. Poynton, M.D., F.R.C.P. (London); 1924. Bristol: John Wright & Sons, Limited. London: Simpkin, Marshall, Hamilton, Kent & Company, Limited. Post 8vo., pp. 376, with illustrations. Price: 12s. 6d. net.
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- HANDBOOK OF BACTERIOLOGY FOR STUDENTS AND PRACTITIONERS OF MEDICINE**, by Joseph W. Bigger, M.D. (Dublin), F.R.C.P.I., D.P.H.; 1925. London: Baillière, Tindall and Cox. Post 8vo., pp. 413, with illustrations. Price: 12s. 6d. net.
- ACUTE INFECTIOUS DISEASES: A HANDBOOK FOR PRACTITIONERS AND STUDENTS**, by J. D. Rolleston, M.A., M.D. (Oxon.); 1925. London: William Heinemann (Medical Books), Limited. Demy 8vo., pp. 375. Price: 12s. 6d.
- A MANUAL OF DISEASES OF THE EYE**, by Charles H. May, M.D. (New York) and Claud Worth, F.R.C.S. (England); Fifth Edition; 1924. London: Baillière, Tindall and Cox. Sydney: Angus and Robertson, Limited. Post 8vo., pp. 460, with illustrations.
- PRACTICAL LECTURES**, Delivered under the Auspices of the Medical Society of the County of Kings, New York; 1923-1924 Series. New York: Paul B. Hoeber. Demy 8vo., pp. xviii. + 484, with one hundred and thirty-two illustrations and three colour plates. Price: \$5.50.

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- MAR. 18.—Western Australian Branch, B.M.A.: Branch.
- MAR. 18.—Western Medical Association, New South Wales.
- MAR. 24.—New South Wales Branch, B.M.A.: Council (Quarterly).
- MAR. 25.—Victorian Branch, B.M.A.: Council.
- MAR. 26.—New South Wales Branch, B.M.A.: Branch (Annual).
- MAR. 27.—Queensland Branch, B.M.A.: Council.
- MAR. 31.—New South Wales Branch, B.M.A.: Council.
- MAR. 31.—Section of Hygiene and Preventive Medicine, New South Wales Branch, B.M.A.
- APR. 1.—Victorian Branch, B.M.A.: Branch.
- APR. 7.—Tasmanian Branch, B.M.A.: Council.
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